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PROCEEDINGS OF THE 1990 NORTHEASTERN RECREATION RESEARCH SYMPOSIUM

FEBRUARY 25-28, 1990

SARATOGA SPRINGS, NEW YORK



NORTHEASTERN RECREATION RESEARCH MEETING POLICY STATEMENT

The Northeast Recreation Research meeting seeks to foster quality information exchange between recreation and travel resource managers and researchers throughout the Northeast. The forum provides opportunities for managers from different agencies and states, and from different governmental levels, to discuss current issues and problems in the field. Students and all those interested in continuing education in recreation and travel resource management are particularly welcome.

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The Steering Committee wishes to thank John Nelson for his assistance in developing the conference data base.

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RECREATION RESEARCH SYMPOSIUM**

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State Parks Management and Research Institute

Saratoga Springs, New York

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THE RELATIONSHIP BETWEEN QUALITY OF RECREATION
OPPORTUNITIES AND SUPPORT FOR RECREATION FUNDING

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The relationship between perceived quality of recreation opportunities and public support for recreation funding was investigated using data from a statewide survey of Vermont residents. While few statistically significant bivariate relationships were found, regression analysis suggests that these variables may be mutually reinforcing.

Introduction

All public park and recreation agencies share a number of overarching objectives. High on this list of common objectives are provision of high quality recreation opportunities and maintenance of adequate public funding support. But what is the relationship between these two important objectives? Does perceived quality of recreation opportunities affect public funding support? Can both of these objectives be maximized simultaneously?

It might be hypothesized that if the quality of recreation opportunities is perceived as relatively low, then public support for recreation funding might be relatively high in order to compensate for low quality. Alternatively, low perceived quality of recreation opportunities might discourage public funding support because recreation is viewed as an ineffective public investment. Alternative hypotheses are also possible given relatively high perceived quality of recreation opportunities. If the quality of recreation opportunities is perceived as relatively high, then public support for additional recreation funding might be relatively low due to a perceived lack of need. Or high perceived quality of recreation opportunities may lead to high public support for recreation funding because it is viewed as an effective public investment. The objective of this study is to investigate these hypotheses.

The Study

This study is an outgrowth of the 1988 Vermont Recreation Plan Resident Recreation Survey (State of Vermont 1988). Study data are drawn from a telephone survey of a representative sample of Vermont residents. A stratified random sampling

procedure was used as suggested by Dillman (1978). A response rate of 77 percent was attained yielding a sample size of 494 completed surveys.

The dependent variable, support for recreation funding, was measured by a series of five questions. Each question asked the degree of support for additional recreation funding from alternative sources: government taxes such as income and property taxes; fees and charges paid by recreation users; special tax on the sale of hunting and fishing equipment; special tax on the sale of other recreation equipment; and private gifts, grants, and donations. Responses were recorded by means of a four-point Likert scale ranging from "very good idea" to "very bad idea."

The independent variable, quality of recreation opportunities, was measured by three series of questions. The first series of questions asked respondents to judge the quality of eight major types of state recreation resources using letter grades ranging from A (excellent) to F (very poor). The second series of questions asked respondents to judge whether the quality of these same eight recreation resources was "getting better," "staying the same," or "getting worse." The last series of questions asked respondents to judge the severity of 32 potential state recreation problems using the response categories of "big problem," "small problem," and "no problem."

Findings

Descriptive findings for the dependent and independent variables are shown in Figures 1-3 and Table 1. Public support for recreation funding varied considerably among the five funding sources included in the study (Fig. 1). In general, the public strongly favors funding mechanisms which place much of the financial burden more directly on the recreation user. A strong majority of respondents favored fees and charges and equipment taxes as a source of additional public recreation funding. Only 36 percent of respondents favored additional broad-based taxes, such as income, sales and property taxes, as a source of additional recreation funding. As might be expected, nearly all respondents favored private gifts, grants and donations.

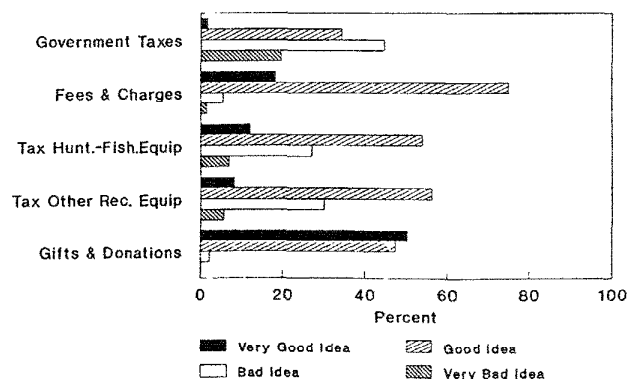


Figure 1. Attitudes toward funding sources for recreation.

The present quality of all eight recreation resources was rated as generally high (Fig. 2). The letter grades assigned by respondents were converted to a traditional four-point "academic" scale where A=4, B=3, C=2, D=1 and F=0. Resulting "grade point averages" ranged from a high of 3.58 for scenic quality of the landscape to a low of 2.41 for local government facilities and services. Resident opinions about trends in the quality of these eight recreation resources were more varied (Fig. 3). Responses were coded as "getting better" = 1, "staying the same" = 0, and "getting worse" = -1.

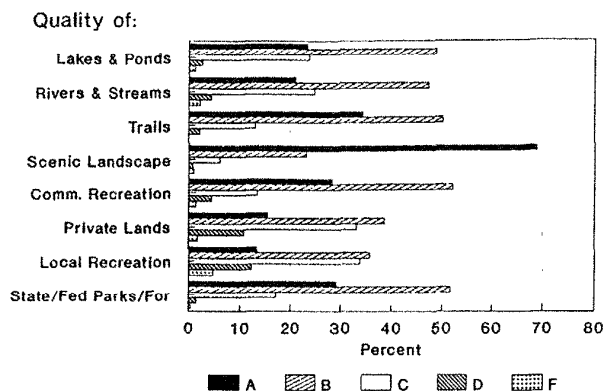


Figure 2. Grading of quality of recreation resources.

For only two recreation resources did a majority of respondents feel that quality was staying about the same. Trends were felt to be most favorable for commercial recreation establishments and least favorable for lakes and ponds. Respondent opinions about the severity of 32 potential state recreation problems were highly varied (Table 1). Responses were coded as "big problem" = 2, "small problem" = 1, and "no problem" = 0. Severity of problems ranged from a high of 1.6 for destruction of wildlife habitat to a low of 0.8 for lack of access to rivers and streams.

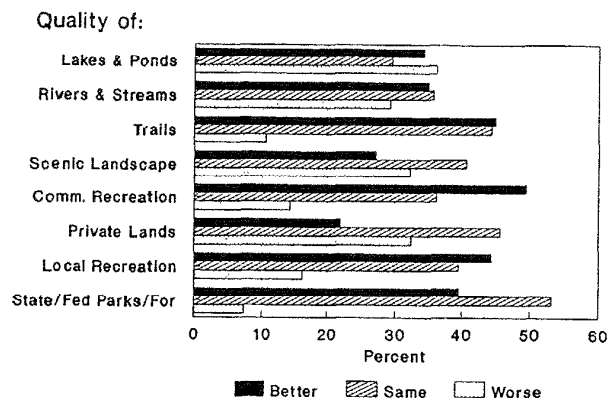


Figure 3. Trends in quality of recreation resources.

Table 1. Importance of recreation related issues.

| Issue | Importance | | | Average* |
|--|-------------|---------------|------------|----------|
| | Big Problem | Small Problem | No Problem | |
| (Percent) | | | | |
| Destruction of wildlife habitat | 66.0 | 26.4 | 7.6 | 1.6 |
| Water quality of lakes and ponds | 63.4 | 27.0 | 9.6 | 1.5 |
| Vandalism of public recreation facilities and areas | 58.2 | 34.7 | 7.1 | 1.5 |
| Destruction of fish habitat | 58.0 | 31.7 | 10.3 | 1.5 |
| Lack of respect for private property | 55.3 | 35.9 | 8.9 | 1.5 |
| Development along lakes and ponds | 56.6 | 31.7 | 11.7 | 1.5 |
| Non-compliance with environmental protection laws | 53.8 | 36.5 | 9.7 | 1.4 |
| Water quality of rivers and streams | 52.9 | 37.2 | 9.9 | 1.4 |
| Loss of scenic landscape | 57.2 | 27.6 | 15.2 | 1.4 |
| Lack of recreation opportunities for special populations | 47.7 | 34.4 | 18.0 | 1.3 |
| Crowding of boats on lakes and ponds | 48.6 | 32.4 | 19.1 | 1.3 |
| Inadequate planning and design of commercial recreation developments | 45.1 | 37.5 | 17.4 | 1.3 |
| High cost for use of commercial recreation areas | 41.5 | 40.6 | 17.9 | 1.2 |
| Inadequate funding for public recreation | 37.6 | 45.3 | 17.1 | 1.2 |
| Loss of wetlands | 41.5 | 33.9 | 24.6 | 1.2 |
| Lack of community indoor recreation and sports facilities | 38.4 | 37.1 | 24.4 | 1.1 |
| Lack of public information on recreation issues | 34.9 | 40.8 | 24.2 | 1.1 |
| Liability of commercial recreation businesses | 35.7 | 36.5 | 27.9 | 1.1 |
| Lack of responsiveness by public agencies | 30.6 | 45.4 | 24.0 | 1.1 |
| Liability of private landowners | 32.6 | 35.6 | 31.9 | 1.0 |
| Posting of private land | 30.4 | 38.8 | 30.8 | 1.0 |
| Lack of access to lakes and ponds | 28.2 | 37.3 | 34.5 | 0.9 |
| Lack of community outdoor recreation facilities for sports | 26.6 | 40.6 | 32.8 | 0.9 |

(continued)

Table 1. (continued)

| Issue | Importance | | | Average* |
|--|-------------|---------------|------------|----------|
| | Big Problem | Small Problem | No Problem | |
| | (Percent) | | | |
| Inadequate law enforcement at recreation areas | 21.2 | 48.1 | 30.7 | 0.9 |
| Lack of public information on recreation opportunities | 23.3 | 43.4 | 33.3 | 0.9 |
| Liability of government agencies | 28.2 | 33.6 | 38.2 | 0.9 |
| High cost for use of public recreation areas | 21.0 | 42.4 | 36.6 | 0.8 |
| User conflicts on rivers and streams | 21.3 | 40.0 | 38.7 | 0.8 |
| Lack of organization of recreation user groups | 18.0 | 43.9 | 38.1 | 0.8 |
| Lack of trails linking towns and recreation areas | 18.7 | 42.5 | 38.7 | 0.8 |
| Crowding on trails | 17.0 | 43.8 | 39.2 | 0.8 |
| Lack of access to rivers and streams | 17.5 | 42.0 | 40.5 | 0.8 |

* Average refers to the mean score derived from the following coding system: Big problem = 2, small problem = 1, no problem = 0.

A variety of statistical techniques was used to examine the relation of quality of recreation opportunities and support for funding alternatives. Correlation analysis revealed only minor associations ($r \leq 0.36$) between ratings of quality, trends in quality, and severity ratings and the dependent variable -- support for funding. A moderate inner correlation ($r = 0.488$) was found in one of the independent variables between quality ratings of lakes and ponds for recreation and quality ratings of streams and rivers for recreation. Inner correlations between all other variables were negligible ($r \leq 0.37$).

Multiple and stepwise regressions of the dependent variable, support for recreation funding, on the independent variables: quality ratings of recreation resources, trends in quality, and severity ratings, were not significant. Subsequently, the independent variable "quality of recreation resources" was disaggregated into its eight independent questions and the dependent variable "support for recreation funding," was separated into the five individual questions comprising the variable. Ratings on the individual questions were transformed to standard scores. A series of multiple regressions were run that systematically regressed each of the transformed support for funding questions on independent variables that included the disaggregated quality ratings of recreation resources, trends in quality and severity ratings. The analysis revealed a relationship between ratings of quality, trends in quality, and severity ratings and the dependent variable "support for governmental funding" ($p = 0.0123$), but explained only six percent of the variance.

As a final exploratory analysis, the independent variable -- quality ratings of recreation resources -- was collapsed into "high quality" and "low quality" categories for each of the eight independent questions comprising the variable, as well as for the aggregate variable itself. Through a similar process, the ratings of the dependent variable were recoded into "support" and "opposi-

tion" for funding on each of the five "support for funding" questions and the aggregated variable. Chi square analysis (51 total) indicated a significant relationship between perceived "quality of recreation provided by local government" and respondent "support for government taxes" to fund recreation: $\chi^2 = 5.127$, $p = 0.023$. A significant relation also was found between ratings of the "scenic quality of Vermont's landscape for recreation" and "support for funding through gifts, grants, and donations": $\chi^2 = 5.26$, $p = 0.0218$. All other chi squares were nonsignificant.

Conclusions

This study provides selected insights into two issues of central importance for all public park and recreation agencies: quality of recreation opportunities provided and degree of public support for recreation funding. The present quality of recreation resources in Vermont is perceived by state residents as generally high, while trends in recreation resource quality and the severity of recreation problems are seen as more varied. These findings suggest appropriate areas of emphasis for state park and recreation agencies. Public support for additional recreation funding is less positive. The majority of respondents favor provision of additional funding only through user fees and donations.

The relationship between quality of recreation opportunities and support for public funding of recreation is less clear. Few statistically significant bivariate relationships between these variables were found. However, a regression analysis between the independent variables and the dependent variable "support for governmental funding" did reveal a positive, albeit weak, relationship. This suggests that, in general, positive public assessment of the quality of recreation resources may enhance public support for broad-based governmental funding of recreation programs. This is encouraging in that it suggests that park and recreation agency objectives of

providing high quality recreation opportunities and maintaining adequate public funding support are mutually reinforcing. However, this conclusion is highly tentative given the lack of strength of this relationship. Refinement of analytical and measurement techniques are needed to further explore this potentially important issue.

Literature Cited

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State of Vermont. 1988. 1988 Vermont recreation plan resident recreation survey. Waterbury, Vermont: Vermont Department of Forests, Parks and Recreation.

OUTDOOR RECREATION AND ENVIRONMENTAL CONCERN:

A FURTHER EXPLORATION

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The relationship between outdoor recreation and environmental concern has drawn empirical attention in several studies since its original exploration by Dunlap and Heffernan (1975). Only marginal support for such a relationship has been found. This study further explores this relationship, focusing particularly on measurement and analytical techniques including respondent self-assessment of recreation participation, creation of a cumulative recreation participation index, and the use of paired appreciative and less-appreciative outdoor recreation activities. In general, the Dunlap-Heffernan hypotheses are supported. Participation in outdoor recreation activities which emphasize appreciation of the natural environment exhibit the strongest associations with environmental concern.

Introduction

The degree to which people are willing to trade off economic benefits for environmental protection has been one of the major concerns of research into the sociology of natural resources. Attitudes about environmental protection have been found to vary considerably over a variety of populations, but the reasons for such variance are not well understood. Early studies focused on traditional socio-demographic variables -- age, income, education, etc. -- as predictors of environmental concern, but results were less than satisfying. Only a very small percentage of the variance in environmental concern could be explained (Van Liere and Dunlap 1980). More recent research has turned to cognitive and behavioral variables as potential predictors of environmental concern. To what extent do people's thought and behavior patterns influence their attitudes about environmental protection? Several studies have focused on participation in outdoor recreation.

Outdoor Recreation and Environmental Concern

A relationship between outdoor recreation and environmental concern was first suggested by Dunlap and Heffernan (1975). Among the several hypotheses formulated, two have received empirical testing. The first suggested that outdoor recreation participation is positively associated with environmental concern. Four rationales were cited: 1)

participation in outdoor recreation creates awareness of environmental problems, 2) participation creates a commitment to the protection of valued recreation sites, 3) participation creates appreciation for the natural state of the environment and an opposition to actions which would alter it, and 4) participants are exposed to informational and educational campaigns which stress the importance of environmental quality. The second hypothesis suggested that "appreciative" outdoor recreation activities, such as hiking and camping, would exhibit stronger associations with environmental concern than "consumptive" ones such as hunting and fishing in which something is removed from the natural environment. Moreover, the authors suggested that participation in "abusive" outdoor recreation activities, such as snowmobiling and trailbiking, might be negatively associated with environmental concern. The rationale was based on the notion that appreciative outdoor recreation activities are focused on enjoyment of the natural environment without altering it, and this is compatible with a preservationist orientation. Consumptive activities are focused on extraction of elements from the natural environment and reflect a more utilitarian orientation to the environment. Moreover, abusive activities inherently involve considerable alteration of the natural environment and may reflect a lack of concern with environmental quality.

Dunlap and Heffernan (1975) went on to test their hypotheses using measures of participation in five outdoor recreation activities and eight questions measuring environmental concern. Nearly all of the associations between these variables (measured as gamma coefficients) were in the hypothesized direction (positive), but most were very weak, at the 0.10 level or below. Appreciative activities did, however, exhibit higher associations with seven of the eight measures of environmental concern than did consumptive activities.

Subsequent research has produced negligible-to-weak support for both hypotheses. Geisler et al. (1977) reported Pearson product-moment correlation coefficients ranging from -0.02 to 0.15 between six types of outdoor recreation activities and fifteen measures of environmental awareness and support for environmental protection. Although the bivariate relationships weakly supported both hypotheses, most of the relationships were found to be spurious, caused by interaction with demographic variables. The authors, therefore, concluded that little or no support could be offered for the Dunlap and Heffernan (1975) hypotheses.

Pinhey and Grimes (1979) found essentially negligible associations measured by a chi-square test between outdoor recreation participation and perceived value and appropriate uses of Louisiana marsh lands. Appreciative activity participants were more likely to offer support for protection of such areas, but equally or less likely to value the areas. While this study offers little or no support for the Dunlap and Heffernan hypotheses, Jackson (1986) has argued that the measures of

environmental concern were too narrow from which to draw generalized conclusions.

Van Liere and Noe (1981) tested seven recreation activities against the New Environmental Paradigm, developed by Dunlap and Van Liere (1978). Mixed patterns of association and low coefficients measured in betas offered little support for the first hypothesis. However, the authors reported that appreciative activities exhibited slightly higher associations with the Paradigm than did consumptive and abusive ones. While this study was the fourth to find only weak-to-negligible support for the Dunlap and Heffernan hypotheses, the authors maintained that improved measures of concepts and refined study designs might yet yield more substantive results.

Jackson (1986, 1987) did in fact suggest a new tact to study the second Dunlap and Heffernan hypothesis. Using data from a 1984 survey of residents of urban Alberta, Canada, Jackson analyzed attitudinal differences between participants in eight outdoor recreation activities. To do so, Jackson "paired" participants of two activities, eliminating respondents who participated in both activities or in neither activity. A "dummy variable" was then created by assigning participants of the first activity a code of 1 and participants of the second activity a code of 0. The "dummy variable" was then regressed against two measures of environmental concern (based, at least in part, on attitudinal indices suggested by Dunlap and Van Liere (1978, 1984) and Knopp and Tyger (1973)). The resulting correlations and partial correlations (controlling for age, sex, education, and income) served as useful indices of the divergence in attitudes between participants in the first activity and participants in the second activity.

Jackson's reported partial correlations between the dummy variables and his measures of environmental concern indicate that participants in appreciative outdoor activities (cross-country skiing, hiking, and canoeing) are moderately more environmentally concerned than participants in consumptive activities (fishing and, separately, hunting) or abusive activities (trail biking, motorboating, and snowmobiling -- which Jackson refers to as "mechanized" activities). No difference was found between participants in consumptive activities and abusive activities. The author concluded that the data lent substantial support to the second Dunlap and Heffernan hypothesis.

A Further Exploration

This study further explores the relationship between outdoor recreation and environmental concern, focusing particularly on measurement and analytical techniques. Several new research approaches are utilized to test Dunlap and Heffernan's first hypothesis. Advancements by Jackson (1986) for the analysis of "paired" activities to test the second Dunlap and Heffernan hypothesis are employed and refined. This study

surveyed a random sample of Vermont residents, addressing their level of environmental concern, their perception of the quality of Vermont's natural environment, their participation in a variety of outdoor recreation activities, and selected demographic characteristics.

The Survey

The survey was conducted by telephone and was administered to 503 Vermont residents. The sample was selected following the procedures suggested by Dillman (1978) with minor modifications to ensure that the sample was representative of the state's settlement pattern and gender distribution. Telephone calls were made by trained, paid interviewers. Interviews were permitted with any full-time Vermont resident answering the telephone who was at least 18 years of age. Ninety-three potential respondents declined to be interviewed or provided substantially incomplete and/or unusable results, for an overall response rate of eighty-four percent.

Environmental Concern

To measure environmental concern respondents were read six statements and asked, using a four-point Likert scale, the extent to which they agreed or disagreed with each. The statements were as follows:

1. The government should acquire more land in Vermont to protect the environment.
2. Environmental protection laws in Vermont are too strict.
3. Vermont should avoid rapid economic growth.
4. We are approaching the limit of the number of people Vermont can comfortably support.
5. Vermont is growing too rapidly.
6. Vermont should do more to promote economic growth.

These statements addressed environmental protection sentiments and attitudes toward potentially environmentally-adverse economic growth. Connerly (1986), based on the work of Neiman and Loveridge (1981), suggests that such statements should exhibit theoretical unity in their conceptual approach to measuring environmental concern. All of the above statements are of the "general" category in that they are largely abstract or hypothetical and do not make explicit the costs which may be associated with specific environmental protection measures. The reasoning behind these statements is that economic and population growth usually entail some degree of environmental damage. An environmentally concerned individual would place a higher personal preference value on the environmental quality benefits of limiting population and economic growth than on the benefits economic growth might bring. Responses were coded so that higher scores for each question represented greater environmental concern. An Environmental Concern Index was created by adding the values of the responses to the six statements, each statement receiving equal weight.

Outdoor Recreation Participation

To measure outdoor recreation participation, respondents were asked whether they participated "often," "sometimes," or "never" in each of seven activities: hiking, camping, picnicking, cross-country skiing, hunting and fishing (asked as one activity), boating, and downhill skiing. The first four activities were considered appreciative since they tend to be motorless and can be accomplished with a minimum of environmental alteration. Hunting and fishing were considered consumptive since they involve removing something from the natural environment. Downhill skiing and boating were considered depreciative since (with the possible exception of sailboating) they involve motorized transport and alteration or disruption of the natural environment. Responses were coded so that a higher score indicated a greater level of recreation participation.

A note of caution is in order concerning the recreation activity classification scheme. It is apparent that classification of recreation activities as "appreciative," "consumptive," or "depreciative" involves some assumptions and generalizations about those activities. Camping, for example, can range from primitive, leave-no-trace backpacking to recreational vehicle camping. However, the majority of camping activity is assumed to be nonmotorized and focused primarily on appreciation of the natural environment. While it is clear that the classification scheme is not empirically precise, it is felt to be reasonable for the purposes of this study in that it follows the previous research described earlier in this paper. The activity category labels "appreciative," "consumptive," and "depreciative" may also cause some consternation. These labels are not meant to cast value judgements on participants or to suggest inherent moral worth of related recreation activities. They are merely shorthand labels used in the literature to suggest varying attitudinal orientations to the environment. The descriptor "depreciative" has been substituted in this study for the more value laden "abusive" which is often found in the literature.

Measurement and Analysis

Measurement and analytic techniques varied from previous studies in three potentially important ways. First, respondents were asked for a relative self-assessment of the frequency of their recreation participation rather than the usual more quantitative, absolute format such as activity occasions per day or week. This distinction may be of importance because the perception of one's own level of participation may be more important in developing attitudes toward environmental protection than actual frequency of participation in the activity. For example, protecting forests may be more important to those who consider themselves to be frequent cross-country skiers than to those who actually participate in the sport more frequently but do not consider themselves frequent cross-country skiers because of their high level of participation in

other sports as well, or for any other reason. The variable used here is thus more cognitive than the strictly behavioral variables used in the past. Recent research indicates that cognitive approaches to understanding environmental concern offer considerable promise (Dunlap and Van Liere 1984, Mohai and Twight 1987, Samdahl and Robertson 1989).

Second, this study utilizes a summated index of recreation participation, which was not found in past studies. If participation in outdoor recreation does indeed bring about a greater degree of environmental concern, we might assume that the effect is cumulative, and that a summated measure of participation in all measured outdoor recreation activities would be useful in testing Hypothesis 1. Thus, a Recreation Participation Index was formed by adding responses for each of the seven recreation activities. This analysis must be accompanied by a cautionary note: while a respondent who participates "often" in several activities quite likely participates in outdoor activities more often than a respondent who participates "often" in just one activity, this is not necessarily the case. A hiking enthusiast, for example, could spend more time in outdoor recreation activities than one who more casually participates in cross-country skiing and in boating, yet considers his participation rate in each to be "often." Thus, the Recreation Participation Index may be partially considered a measure of respondent diversity of outdoor recreation participation.

Finally, this study heeds Jackson's call for replication of his pairing technique for testing Hypothesis 1, but refines it in several significant ways. First, although Jackson compared 26 pairs of activities, the activities in each pair generally had little in common. For example, biking and motorboating are good examples of appreciative and abusive activities, respectively, but have little commonality in terms of the types of equipment used, exertion required, or type of natural environment in which they are pursued. Other pairs of activities differ in time of year and even in time of day appropriate for such recreation.

One particularly interesting pair of activities pursued by Jackson and also Knopp and Tyger (1973) is that of snowmobiling and cross-country skiing. Both activities are pursued during the winter, often on the very same trails. However, the degree of mechanization, noise, exertion, and equipment type is drastically different.

This study pairs just two activities, cross-country skiing and downhill skiing to examine Hypothesis 2. Both activities require substantial exertion, similar equipment, similar environments and seasons, and are pursued in a relatively similar movement pattern. Yet cross-country skiing is clearly more "appreciative" than downhill skiing, which involves motorized transit and severe alterations to the natural landscape. The degree to which downhill skiing is a "depreciative" activity is debatable, but cross-country skiing is

quite evidently more in harmony with and appreciative of the natural surroundings. While it is true that downhill skiing generally requires greater expense to the participant, the partial correlations used in this study control for socioeconomic variance. The effects of factors such as season and equipment type, which were often far different between activities in the Jackson study (and may, therefore, account for some of the variance in environmental concern), could not be statistically controlled in the Jackson study.

A second major deviation from the Jackson study was in the coding of the dummy variables. While Jackson's study did measure frequency of participation in the various activities, the coding scheme masked such differences. Participants in one activity, irrespective of frequency of participation, were coded as 1, while participants of any frequency in another activity were coded as 0. By contrast, the coding scheme in this study differentiated among self-assessed participation rates. The expanded "dummy variable" used in this study, named "SKI," was coded as follows.

| | SKI Value |
|---|-----------|
| Cross country "often," downhill "never" | 4 |
| Cross-country "sometimes," downhill "never" | 3 |
| Downhill "sometimes," cross-country "never" | 2 |
| Downhill "often," cross-country "never" | 1 |

As suggested by Jackson, participants in both activities and participants in neither activity were excluded from the analysis. This dropped the number of valid cases to 115 for this part of the analysis only.

A final difference between the two studies is that Jackson surveyed only the urban residents of Alberta (residents of Calgary and Edmonton), whereas this study surveyed a random sample of residents statewide. The previous study did not, therefore, need to control for the effect of hometown size; this study did.

Data were also gathered on four other demographic characteristics of respondents: age, income, education, sex. Measures of outdoor recreation participation were related to the environmental concern index using Pearson's product moment correlation. Partial correlation coefficients are reported as the analysis was controlled for the five demographic variables.

Findings

Hypothesis 1, that outdoor recreation participation is positively associated with environmental concern, receives support from the data, although coefficients are fairly low. Table 1 provides a summary of findings. Participation in four of the seven recreation activities was found to be significantly, albeit weakly, associated with

Table 1. Relationship Between Outdoor Recreation Activity and Environmental Concern.

| Outdoor Recreation Activity | Partial Correlation Coefficient | Significance Level |
|----------------------------------|---------------------------------|--------------------|
| Hiking | 0.17 | 0.00 |
| Camping | 0.15 | 0.01 |
| Cross-country skiing | 0.13 | 0.02 |
| Picnicking | 0.11 | 0.03 |
| Boating | 0.09 | 0.09 |
| Hunting and fishing | 0.08 | 0.17 |
| Downhill skiing | -0.02 | 0.65 |
| Appreciatives | 0.20 | 0.00 |
| Consumptive | 0.08 | 0.17 |
| Depreciatives | 0.04 | 0.43 |
| Recreation Participation Index | 0.18 | 0.00 |
| SKI (Cross-country vs. downhill) | 0.25 | 0.01 |

environmental concern. The Recreation Participation Index, which serves as a measure of overall outdoor recreation participation, is associated with environmental concern somewhat more strongly than are its individual components. This suggests that the effect of outdoor recreation participation, while weak with regard to individual activities, may well be cumulative.

Moreover, when the Recreation Participation Index is added to a multiple regression model containing the five demographic variables, the percentage of explained variance in environmental concern rises significantly from two to six percent. While most of the variance in environmental concern remains unexplained, it should be noted that researchers have historically had difficulty in isolating predictors of environmental concern (Van Liere and Dunlap 1980).

The second hypothesis, that appreciative activities are more likely associated with environmental concern than non-appreciative activities, receives stronger support. Each of the four appreciative activities is positively associated with environmental concern, while none of the other three activities are. A summary index of the four appreciative activities exhibits a significant, moderate association with environmental concern whereas the consumptive activity (fishing and hunting) and a summary index of the depreciative activities do not.

The second hypothesis is further supported by the significant moderate association of the dummy variable SKI with environmental concern. Thus, skiers in the more appreciative cross-country category tend to be more environmentally concerned than participants in the less appreciative downhill category.

Discussion

The relationship between outdoor recreation and environmental concern has continued to draw attention since its original exploration by Dunlap and Heffernan (1975). The reasons for this continuing interest are at least twofold. First, the level of public environmental concern continues to be a critical, but little understood, factor in the policy debate over appropriate levels of environmental protection. While opinion surveys reveal changes in levels of public environmental concern, the scientific literature offers little guidance as to why these changes are occurring. Participation in outdoor recreation is an intuitively appealing explanatory variable.

Second, studies relating outdoor recreation and environmental concern have reported ambiguous results. The problem, it seems, is that some recreational activities (primarily appreciative ones) usually exhibit significant associations with environmental concern, while other activities (consumptive and depreciative ones) do not.

A solution to this problem would appear to be a reformulation of the original Dunlap and Heffernan (1975) hypotheses. From the research to date, it can reasonably be concluded that participation in appreciative outdoor recreation activities is a valuable predictor of environmental concern, but participation in consumptive or depreciative activities is not. Certainly each study within the past decade (Jackson 1986, Van Liere and Noe 1981) and this study support this conclusion.

The support for the Dunlap and Heffernan hypothesis found in this study is generally stronger than that of previous investigations. While this result may simply be a difference of time and place, as suggested by Geisler et al. (1977) and Pinhey and Grimes (1979), it may also reflect methodological improvements. The use of respondent self-assessment of recreation participation and the creation of a recreation participation index should be of particular note.

Also exhibiting a good deal of promise are the methodological techniques pioneered by Jackson (1986). Studying pairs of recreation activities makes intuitive sense, especially when the activities are essentially similar yet differ in degree of appreciation of the natural environment. Future studies might further investigate divergences in environmental attitudes of sailboat and motorboat enthusiasts, bicyclists and motorcyclists, and participants of other such similar activities.

The positive relationships between appreciative outdoor recreation activities and environmental concern would seem to bode well for the environmental protection movement. While participation rates in many outdoor activities are climbing, the growth in participation in appreciative activities has been particularly robust (LaPage 1980, Kelly 1987). Dunlap and Heffernan (1975) may well have been correct when they wrote that

"outdoor recreationists may constitute a potential constituency for environmental activists." Yet to receive adequate empirical attention, however, is the apparently tenuous link between environmental concern and environmental action (Samdahl and Robertson 1989). This is a subject for further investigation.

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BOY SCOUT USE OF PUBLIC LANDS:
IMPLICATIONS FOR COMMUNICATIONS
AND MANAGEMENT STRATEGIES

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Resource managers can apply group-specific, rather than generic, communications and management strategies to different public land user groups. This study describes one user group, Boy Scout troops, and identifies their public land use patterns, activities, and motivations. Results can be used to guide appropriate behavior, enhance their experience, and solicit their help in managing the resource.

Introduction

Resource managers of both natural and cultural sites use interpretation and other communications strategies for a variety of purposes: to enhance visitors' experiences, to achieve specific management goals, and to promote their agencies' images (Sharpe 1982). Managers often apply the same communications messages and strategies to all their visitors. Additionally, managers often apply a single technique to guide appropriate visitor behavior (such as using law enforcement strategies to reduce vandalism) for all visitors. However, just as it is minimally effective to promote a program, site or product to a "typical" or "average" client or user, it is unlikely that carbon copy management or communications strategies used with different user groups will be equally effective in providing appropriate facilities, sites and programs; identifying sources of potential use/user conflicts; protecting the sites; or providing appropriate information.

Differences in user behavior can be particularly divergent when norms for appropriate behavior at resource sites are not known by the visitors. Appropriate opportunities and facilities cannot be provided unless the visitors' needs are known. Therefore, resource managers must attempt to identify these needs, then target their communications and management strategies for user groups just as business persons target market their products and programs (More 1983). Studies have shown that such strategies can be effective (Bright and Manfredo 1989, Deblinger et al. 1989, Huffman and Williams 1986, Huffman et al. 1988, Peine 1986, Roggenbuck 1986, Sharpe 1988, Vander Stoep and Gramann 1987.)

Statement of the Problem

The purpose of this study is to identify land use patterns, activities engaged in, information and other service needs, effective methods for motivating and controlling behavior, and characteristics of Boy Scout groups who use public lands in the southcentral region of the United States.

Results are used to identify implications of and develop strategies for managing and informing these groups in their use of public lands.

Methods

Using a modification of Dillman's (1978) "total design method" (TDM), surveys with reminder postcards were sent to Scoutmasters of five troops in each of 30 councils in Arkansas, Alabama, Kentucky, Mississippi, Missouri and Tennessee. The systematic random sample was drawn with the assistance of staff from the national Boy Scouts of America (BSA) headquarters in Irving, Texas.

Before final printing, the survey instrument was reviewed by several recreation and parks researchers and Boy Scout leaders, then revised. The survey contained both closed- and open-ended questions used to identify the troops' public land use patterns, activities, information and service needs, motivations, and Scoutmasters' strategies for guiding youth behavior during their visits to public lands. Some group demographic information was collected.

Open-ended questions were content analyzed independently by two social scientists (Labaw 1982). Each response was written on an individual index card. Each judge grouped and labelled several response categories based on general concepts included in the answers. Where differences existed, a final decision was made based on primary intent of the question. Frequency tabulation of concept-coded responses was used to analyze data.

Results

A total of 65 questionnaires of the 150 mailed were returned, resulting in a response rate of 43.3%. Two questionnaires were unusable. One was not completed because the troop did not use public lands; the other was not completed because the Scoutmaster was new and, therefore, unfamiliar with troop activities and use of public lands.

Troop Characteristics

The majority of troops (71% of those responding to this question) using public lands were relatively large, having more than 16 members. Twenty-nine percent of the troops had 30 or more members while 29% had 15 or fewer members.

Eighty-five percent of the troops responding to the community size question were from communities having fewer than 50,000 residents, while approximately 49% of these were from quite small communities of less than 5,000. Only about 4% percent of the troops were from communities of more than 500,000 residents.

Many of the troop leaders appear to be highly dedicated and committed to the BSA program as 56% of those responding had more than ten years of experience as Scoutmasters. Only 26% had three or fewer years of experience.

BSA Public Land Use Patterns

Types of lands used by Scout troops are varied, including (in order of use frequency) state parks, waterway areas, national parks, TVA projects, national forests, state forests, local parks, Army Corp of Engineers projects, and miscellaneous other federal and Canadian lands (Fig. 1).

When trip patterns are combined, troops take approximately the same number of day trips as overnight trips to public lands. Of the troops that take day trips, about 19% take three or fewer per year. About 60% take 11 or more day trips per year. No groups indicated that they take between six and ten day trips per year.

Overnight trip patterns are similar, with the majority of troops (68%) taking 11 or more overnight trips per year. Ten percent take three trips per year, and relatively low percentages of the rest of the troops (less than four percent in each category) indicate they take other frequencies of overnight trips. The general pattern seems to indicate that troops tend to take about one day trip and/or one overnight trip each month, with the possible exception of December or August (possibly due to holidays or family vacations).

A variety of adults accompany Scout troops on their trips to public lands. BSA-trained adult leaders accompany 42% of troops. Both untrained volunteer parents (for 21% of the troops) and trained volunteer parents (for eight percent of the troops) either assist trained BSA leaders or take troops themselves on trips to public lands. Only four percent of the troops use college student or other adults to accompany youth during these trips.

Though only 44% of the respondents answered the question regarding ratio of Scout youth to adults, the ratio (regardless of the level of training of adults) seems to vary quite a bit. Of those who responded, almost 41% of the troops have one adult for every five Scouts. Forty-eight percent have one adult for every six to ten Scouts. Less than 11% of the troops have only one adult for every 11-15 youth. The relatively high rate of non-response to this question (56%) raises the question of "why?" Was it

because they did not want to admit to a youth to adult ratio that did not meet BSA standards? If so, such low levels of adult supervision could have major implications for control of Scout behavior during trips to public lands.

Types of activities, activity patterns, and the source of trip/activity planning may all have implications for troop interactions with and impacts on the resource base. About 45% of all the troops indicate that troop trips are planned by the adult leaders with some degree of input from the youth. Twenty-six percent indicate that trips are entirely adult-planned while another 26% indicate that trips are planned primarily by the Scouts themselves.

Scout troops take trips to public lands to engage in a variety of activities. Sometimes there is a primary activity; other times they engage in a variety of different activities during the same trip. By far the most frequently engaged in activities are camping and hiking/backpacking. Other activities include canoeing and other aquatic activities, nature-related activities, development of Scouting skills, sightseeing, and conservation projects. Less than five percent of the troops mentioned having fun or other miscellaneous activities as the primary trip activity (Fig. 2).

Although troops usually have major programs of activities during their trips to public lands, most troops have some "free" or unplanned time. Many of the troops (about 43%) indicate two to four hours of free time. None indicate one or five to ten hours of unprogrammed time. About 27% indicate having more than 11 hours of unprogrammed time each day.

Often (for 45% of the trips) activities engaged in by Scouts during trips to public lands result in their receiving some type of patch or award. Sometimes these are simply place identification patches which serve as souvenirs (eight percent). Participation awards (received 24% of the time) also provide souvenir value. Other patches include awards received for demonstration of special skills or achievements. Achievement awards result from 17% of trips to public land while BSA badges are earned during nine percent of the trips.

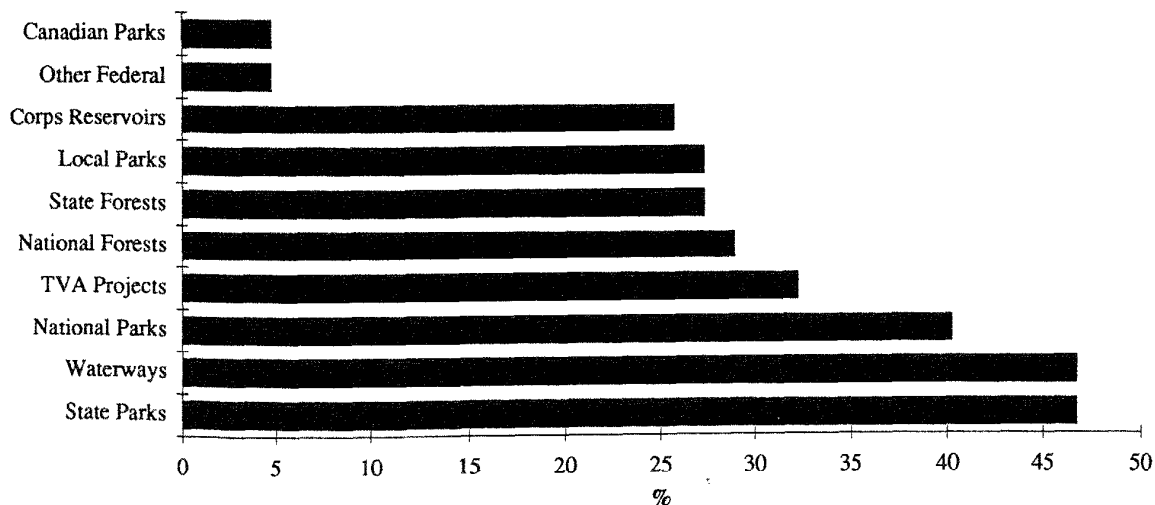


Figure 1. Types of public lands used by Boy Scout troops.

Linking BSA Troops and Public Land Managers

The purposes of other questions in the survey were to determine (1) effective methods of information dissemination to Scout troops, and (2) Scoutmaster perceptions of appropriate troop/public land management agency interactions.

Responses to questions concerning Scout/management agency interactions suggest that, in addition to provision of facilities and supplies to facilitate troop activities, Scout groups would like to have more frequent and positive interactions with agency personnel. Provision of literature and informational services ranks third behind facility provision and direct staff involvement with groups. Although the majority (70%) of Scoutmasters report reading all information that they receive from public agencies, the largest percent of troop leaders share with their troop members only the information that is considered interesting or pertinent. Results indicating that only 11-12% of the leaders share rules and regulations with boys suggest that this information is not deemed interesting or pertinent. This finding supports other research (Bradley 1981; Christensen 1981; Clark et al. 1972a, 1972b; LaHart and Bailey 1975; Petty and Cacioppo 1981; Ross and Moeller 1974;

Roggenbuck Berrier 1982; Wagar 1971) suggesting that written information seldom is attended to unless it is particularly interesting to, or needed by, the reader. More direct, personal methods may be needed in disseminating such information as regulations and management policies.

BSA Expectations of Public Land Managers

While some Scoutmasters (nine percent) believe that public agency personnel are not responsible for providing any services or programs for Scout groups, the majority state that agencies should provide some level of services, including programs and projects specifically for Scouts. Close to 25% identify a desire for managers to provide programs and projects for Scouts, some type of reward or award system for project completion, and general information services. Almost 18% identify provision of some kind of facilities or supplies for Scouts as a public agency responsibility while 16% identify rule enforcement as the managers' responsibility. Ten percent believe agencies should provide interpretive programs and eight percent express a desire for more staff involvement with Scouts in general (Fig. 3).

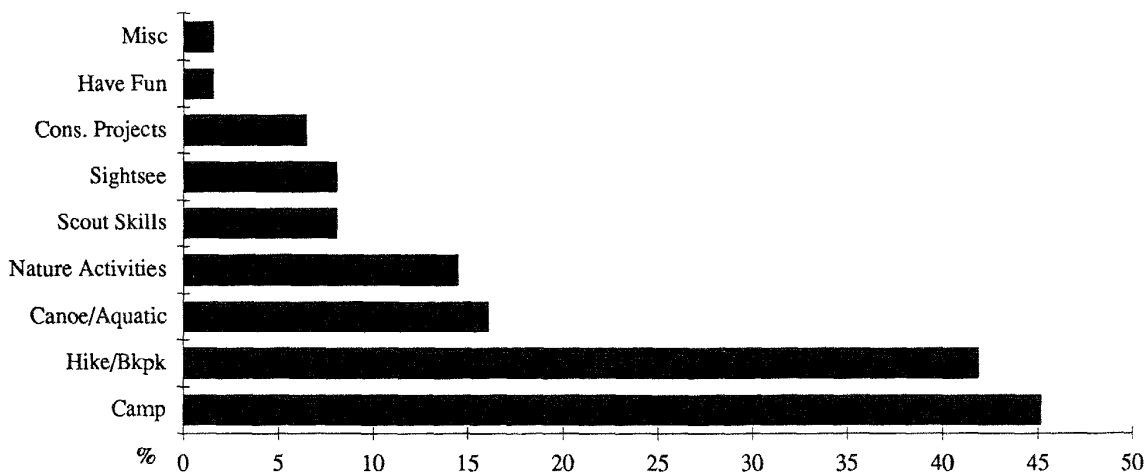


Figure 2. Activities engaged in by Boy Scouts while visiting public lands.

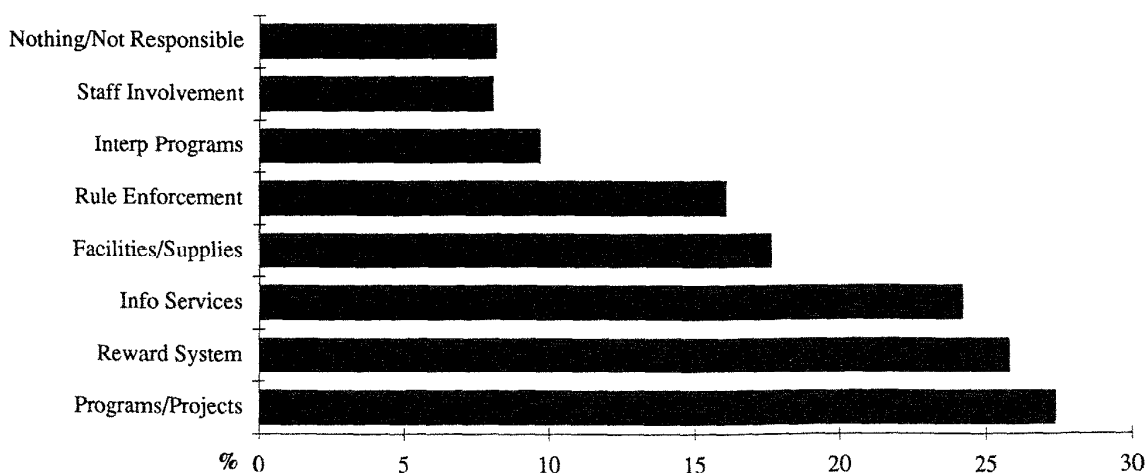


Figure 3. What Scoutmasters believe public agencies should provide.

Inappropriate Scout Behaviors Observed by Leaders

Several of the survey questions requested information relating to Scoutmaster perceptions of (1) types of deprecative behavior committed by other Scout or youth groups while visiting public lands, (2) the reasons for inappropriate behavior, (3) effective methods for dealing with young offenders, and (4) effective motivators for appropriate behavior. Results are presented in Figures 4-6.

Almost 28% of the respondents state they had never seen any Scouts behaving inappropriately while visiting public lands. Others identify a variety of general and specific behaviors engaged in by some Scouts. As observed by Scoutmasters, the most frequently reported type of inappropriate behavior by Scout groups using public lands is misuse of and damage to the resources (34%). Others are miscellaneous actions resulting in a poor Boy Scout image (31%), little regard or respect for other visitors (28%), legal violations (26%), lack of leader control of Scouts (11%), and other rule violations (10%).

The four most frequently cited reasons for inappropriate behavior are (1) inadequate leadership and supervision, (2) lack of consistent, enforced behavior standards throughout the year, (3) lack of training (of both Scouts and leaders), and (4) no knowledge or understanding of agency regulations or expected behavior.

Appropriate and Inappropriate Behavior Motivators

Reflected in the reasons for inappropriate behavior are methods found by Scoutmasters to be most effective in controlling inappropriate behavior. The most frequently mentioned method is to follow through with disciplinary sanctions (or to use the "big stick" approach). While this method involves post-behavioral sanctions, the other most often identified reasons are preventive. These include (1) keeping youth involved in planned programs or activities,

(2) informing youth of and explaining reasons for expected behavior, (3) providing appropriate role modeling by sincere, caring adults, (4) clarifying and adhering to behavioral expectations throughout the year, and (5) using boy-focused techniques such as using the patrol system, activating peer pressure for appropriate behavior, and giving specific responsibilities to the youth.

The two factors ranked highest as motivators for troop participation in service projects are individual badges and patches, and positive adult reinforcement. Receiving medium rankings for motivation effectiveness are (1) challenge, (2) peer approval, and (3) troop awards or certificates. Formal verbal recognition is mentioned the third most frequently, but is ranked only sixth in effectiveness.

Discussion

As in any research, there are limitations to this study, many resulting from the low response rate to the Scoutmaster survey. There are several possible reasons. Actual mailing of the survey was handled by the National BSA Office. Conducting the survey was not its primary function; consequently, delays and inconsistencies in mailing time for the survey and follow-up postcards existed. Also, an essential part of the "total design method" (Dillman 1978) is the use of followup letters with duplicate questionnaires enclosed. This was considered an undue burden on the donated time of the BSA personnel. Therefore, they were not used. Logistical delays caused the survey to be received by Scoutmasters during the summer when many were on vacation, at camp with their troops, or attending the 75th anniversary National BSA Jamboree. Comments on several questionnaires received late indicated leaders had been attending the Jamboree. Finally, leadership of Scout troops often changes during the summer. New leaders may be unfamiliar with past troop activities or may not feel qualified to answer survey questions.

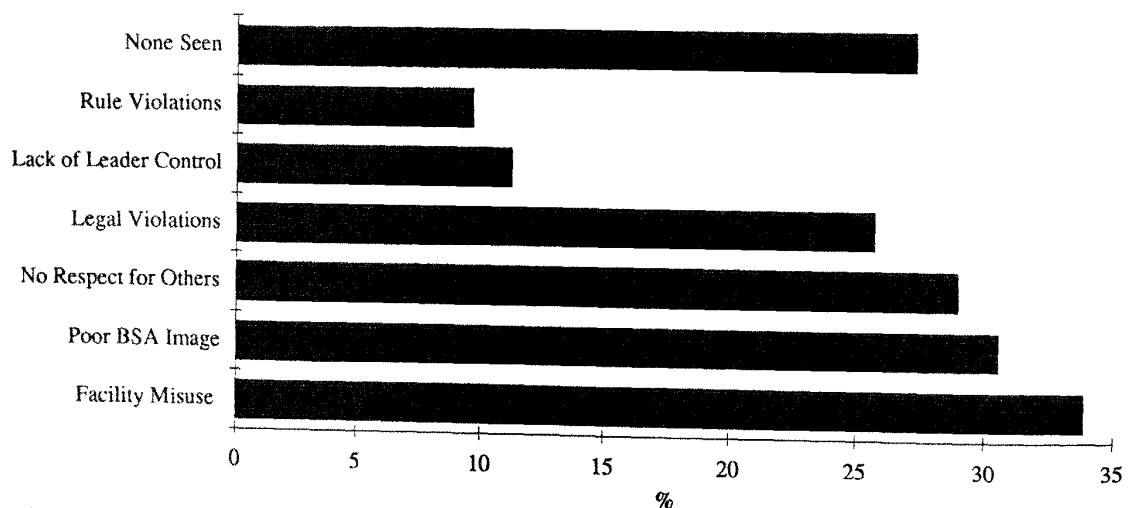


Figure 4. Youth group behavior problems observed by Scoutmasters.

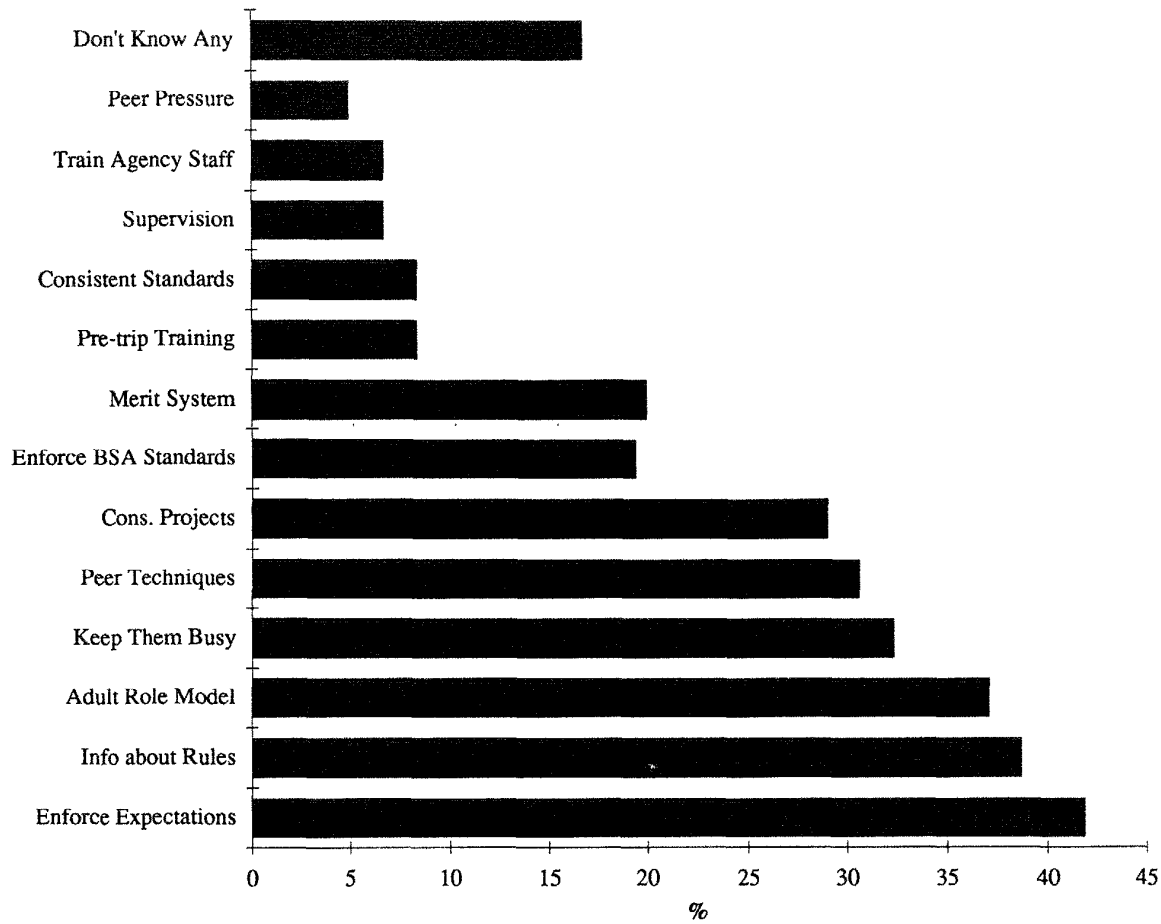


Figure 5. Techniques identified as effective in controlling Boy Scout behavior.

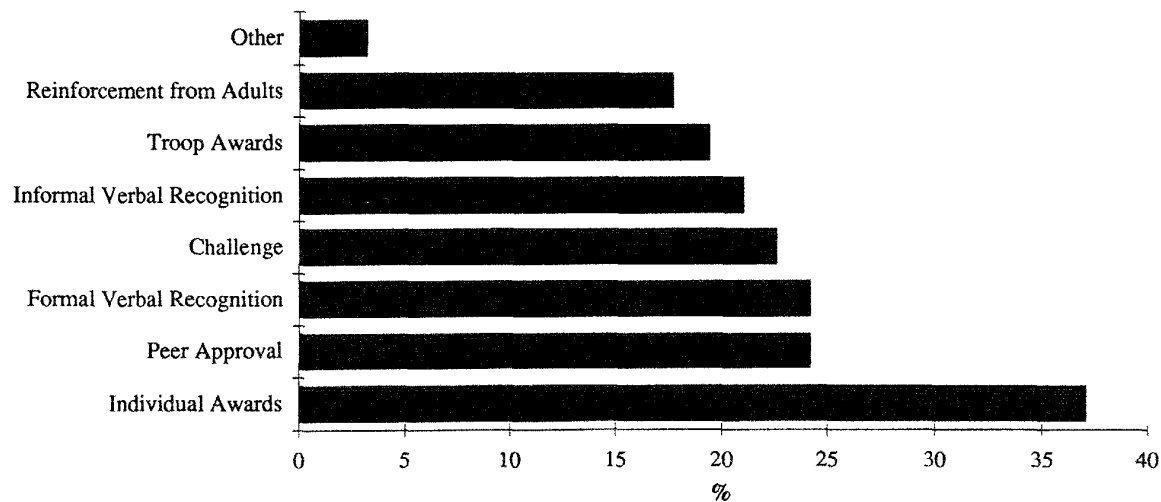


Figure 6. Techniques identified as effective in motivating appropriate Boy Scout behavior.

Some respondents answered only some of the survey questions, occasionally leaving open-ended questions unanswered. For such questions it is difficult to know if they were unanswered because they took more thought and effort or because respondents chose not to address the specific issues. Some questions, such as the one asking for the ratio of adults to youth during trips, may have been left unanswered because of potential guilt or embarrassment. On that particular question, the non-response rate was relatively high (56%). This raises the question of "why?" Was it because they did not want to admit to a youth to adult ratio that did not meet BSA standards? If this is the case, low levels of adult supervision could have implications for control of Scout behavior during trips to public lands.

Despite limitations of the survey process, the responses in combination with specific comments made on the open-ended questions provide insights which can be useful to public land managers who work with Scout group users on their sites. Taken together, results indicate that most Scoutmasters would like increased involvement of public land managers with their troops. Such interactions can occur both prior to and during troop visits to public sites.

Some things that managers might do in preparation for Scout visits are described below.

- Understand the BSA program and participants.

In some cases, Scout groups may feel unwelcome, either because they are placed away from other visitors or because they have no direct contact with agency personnel. In some cases, staff may have negative perceptions of or reactions to Scout groups. Because they are highly visible during their visits (groups often are large and Scouts often wear uniforms, making them recognizable), any inappropriate behaviors are noticeable. Scouts might feel more welcome if managers made efforts to understand the Scouting program and troop activities.

Just as important is that Scout leaders make efforts to communicate with managers about their planned activities and schedules, and seek out information about rules, regulations and appropriate behavior for public lands. This information must be relayed to the youth in a positive and justified manner.

- Identify site-specific periods of intense Scout use.

By identifying periods of heavy Scout use, managers can plan more easily how to allocate staff, programs, campsites, and other resources. Additionally, they can reduce potential conflict between Scouts and other site users by spatially or temporally separating use or specific activities.

- Identify troop expectations for site use.

As is clearly evident in the outdoor recreation literature, visitors whose actual experiences do not match their expectations will be less satisfied with the visit than those whose match. If managers identified troop expectations (via phone or letter during troop inquiries or site reservations), they could better link troops with sites, facilities and programs to meet

their needs. Also, they could direct troops to other, more appropriate sites if their own site could not adequately accommodate or meet the needs of the group.

- Use interpretation to clarify appropriate behavior.

Groups often engage in inappropriate behavior because they simply are unaware of the negative consequences of some behaviors. Informing them, preferably through interpretive strategies rather than in more authoritative or threatening legalese, can reduce negative behaviors as well as promote positive images of the agency and positive interactions between Scout groups and the agency. Direct personal interactions often are more effective than written regulations. Additionally, messages to guide appropriate behavior and achieve other management goals can be incorporated into other interpretive programs.

- Involve Scout groups in public land projects.

Scout groups can become involved in a variety of service and conservation projects such as trail building and maintenance, litter cleanup, bridge-building, and sign painting. Many agencies already participate in such cooperative programs. They often require staff time to plan, coordinate and supervise, but benefits are numerous. They include keeping Scouts active during their visits, accomplishing needed maintenance and management tasks for the agency, improving Scouts' self-image, teaching them new skills, and contributing to development of an appropriate land ethic. The Scouting program is structured to support such service activities.

Although it may not be feasible, particularly with staff and budget constraints, to assign a staff person to work primarily with Scout groups, it can be beneficial to ensure that each Scout or other youth group has some type of direct, personal contact with an agency representative. This can take the form of pre-trip phone conversations with a group member or leader, an informal welcome and overview of the site at an entry booth or visitor center, a special interpretive program (such as an evening campfire program) for all youth group visitors at one time, or simply an informal welcome during a patrol through the group campsite.

For sites which receive intensive local Scout troop use, the agency might consider an open house/training session for adult and/or youth leaders. All the issues (as discussed previously) could be addressed in an open and personal manner. Such a program could increase understanding of and appreciation for each others roles, responsibilities and expectations. It could produce supportive advocacy rather than an adversarial relationship.

Regardless of the package of strategies used, it is important that public land managers and Scout groups communicate openly and personally about their roles, responsibilities and expectations of each other. In this time of increasing use of cooperative ventures between agencies and between public and private sectors, perhaps we should consider also building cooperative ventures between managers and public land users whenever possible. Scout troops provide a ready-made user group for such cooperative programs.

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INDIVIDUAL CHOICE BEHAVIOR IN THE USE OF
COMMON-PROPERTY RECREATION RESOURCES: EFFECTS OF
MOTIVATIONAL ORIENTATION AND MULTIPLE RESOURCE
OPTIONS

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Many outdoor recreation activities are dependent on common-property resources. An experiment was conducted in which subjects having different motivational orientations harvested from a resource pool having two resources, each being of different value and being depleted at different rates. Results showed that individualistic subjects requested more high valued resources and fewer low valued resources than did cooperative subjects, and that in general, subjects shifted their harvest attention from the less plentiful (although more valuable) resource to the more plentiful resource as depletion occurred.

Introduction

Many outdoor recreation activities are dependent on common-property resources. Examples of such resources include fish and game stocks, lakes or reservoirs, forested lands and wilderness areas. Because most of these resources are common-property resources to which people have free and open access, there exists the potential for overuse. The overuse of renewable resources is not new, nor has it occurred infrequently. An example of overuse can be found off the coast of Texas where the population of redfish has declined to a disastrously low level. Conversely, there are examples of carefully maintained renewable resources, such as the spiny lobster population in Quintana Roo, Mexico (Berkes 1989). The question becomes what distinguishes instances of successful resource maintenance from instances of resource overuse and depletion. The purpose of this study was to examine how the characteristics of individuals and characteristics of the resource might cause or prevent the overuse or depletion of common-property resources.

An influential publication on the topic of overuse of common-property resources is Garrett Hardin's (1968) "Tragedy of the Commons." Hardin presents the situation where a number of herdsman

graze their cattle on a common pasture that is free and open to all. It is expected that each herdsman will try to keep as many cattle as possible on the commons and thus maximize his own individual gain. This is an individually rational decision because the profit generated from each animal grazed is pocketed in full by the herdsman who owns it, while the cost, measured as damage to the commons, is shared by all herdsman. The incentive for each herdsman is therefore to increase the size of his own herd. Unfortunately, this conclusion is reached by all the other equally rational herdsman. This sets in motion a process by which the carrying capacity of the pasture is eventually exceeded, and the commons overharvested or depleted.

There is growing evidence that quick technological solutions may not always be available, now or in the future, for response to resource overuse. In a recent review of the literature, Messick and Brewer (1983) identify two types of non-technical solutions to the commons dilemma. The first involves structural solutions that come about through coordinated, organized group action (Kramer and Brewer 1984), and include political solutions (Hardin 1968). These solutions typically require group members to relinquish their free access to the commons, and to institute some other system of resource allocation in its place.

The second type of solution relies upon individual preferences and social motives to maximize those factors that influence individuals to include collective or group interests in their personal decision making. Thus, individuals are encouraged to voluntarily restrain their use or consumption in the absence of external constraint or coercion (Kramer and Brewer 1984). This is the solution of interest in this paper.

Literature Review

This study focuses on two general dimensions of the commons dilemma; the characteristics of individuals involved in a commons dilemma, and characteristics of the resource being used or consumed. Specifically, this research examines the relationship of individuals' motivational orientation to use behavior, and the effects of choice options between two resources having different values, pool sizes and depletion trends.

Motivational Orientation

Research has shown that different individuals have different motivational orientations, and that these orientations are related to differences in use or choice behavior (Pruitt 1967; Messick and McClintock 1968; McClintock et al. 1973; Kuhlman

and Marshello 1975 a,b; Griesinger and Livingston 1973). Several recent studies have extended this earlier research by examining the effects of motives on choice behavior in an n-person "sequence dilemma," (Liebrand 1984; Liebrand and Van Run 1985) and in a "replenishable resource dilemma" (Loomis 1989). Liebrand (1984) classified individuals into one of four motivational orientations (altruistic, cooperative, competitive, individualistic). These individuals then participated in an n-person sequence dilemma. Results of his study showed significant differences in harvest behavior due to motivational orientation; competitive persons took the most, individualistic persons took less but more than the average amount, cooperative persons took less than the average and altruistic persons took the least.

Liebrand and Van Run (1985) conducted a similar sequence dilemma study using subjects in the United States and the Netherlands. Two different procedures were used to classify the motivational orientation of subjects, the first being that used by Kuhlman and Marshello (1975b) and the second a geometric procedure (Liebrand 1984). The relationship between choice behavior and motivational orientation was as expected for both the Netherlands and United States participants, replicating the work of Liebrand (1984).

The last study (Loomis 1989) used a replenishable resource dilemma design. Subjects were classified as either cooperative or individualistic using the geometric procedure (Liebrand 1984), who then harvested resources from what they believed was a replenishable resource pool. Results showed a significant difference in harvest behavior between cooperative and individualistic subjects. During three of the four 10-trial stages, and for the full 40-trial experiment, individualistic subjects requested more resources than did cooperative subjects.

Resource Characteristics

Little research has been directed at the relationship between resource characteristics and individual harvest behavior. Of the limited research that has focused on understanding the effects of differences in resource characteristics, however, investigators have found significant results. Rutte et al. (1987) created a situation in which half the subjects began an experiment with the resource pool having few remaining resources, whereas the other subjects began the experiment with the pool having abundant resources. Results showed that subjects in the scarce resource condition made lower harvest requests than did subjects in the abundant resource condition.

Loomis (1989) extended this work by testing whether individuals modified their harvest behavior in response to a resource pool being slowly depleted over time. Subjects harvested from what they believed was a replenishable resource pool. In reality, pool size was programmed to decline over time regardless of subject harvest behavior. Results revealed a reduction in resource units requested as the experiment progressed. Subjects responded to the declining pool size by requesting fewer units.

Conceptual Framework

Independent Variables Operationalized

Prior research has been directed towards the effects of motivational orientation on harvest behavior of individuals participation in commons dilemma-type games. Only one, however, has examined the effects of motivational orientation through the use of a replenishable resource dilemma (RRD) (Loomis 1989). Nor has motivational orientation been examined in the context of multiple, different-valued resources.

Motivational orientation is not a traditional variable in that it cannot be experimentally manipulated. Instead, the concept represents an underlying trait of the subject. This trait can be measured, and the persons orientation determined. Subjects in this experiment participated in an evaluative procedure prior to the experiment and persons with cooperative or individualistic orientations identified. Cooperative subjects are defined as seeking to maximize collective or joint outcome, and individualistic subjects are defined as seeking to maximize their own outcome (Messick and McClintock 1968; Liebrand 1984).

Resource characteristics in this experiment represent a series of scope conditions. The first is that two resources were available from which subjects could harvest. The two resources had different values; resource A was worth 3 points per unit, and resource B was worth 1 point per unit. Second, both resources were declining in quantity over time. Resource A, however, declined more rapidly than resource B. The final resource characteristic was contingent harvest success. This means the number of resource units (A or B) an individual received in response to a harvest request was contingent upon the number of units remaining in the resource pool at the time of the request. As pool size goes down the number of resource units received in response to units requested also goes down. The amount received in relation to amount requested was proportional to pool size.

Such a resource simulates many natural resources in which exact monitoring is difficult if not impossible. Perhaps the best example of such a naturally occurring resource is a fishery resource. The fishery population is dependent upon the harvesting strategies employed by anglers, and harvest success itself may provide anglers with an indication (perhaps not a very good indication) of the status of the resource.

The dependent variables of interest were number of resource A units requested, number of resource B units requested and total units requested (A plus B combined).

Study Hypotheses

A total of seven hypotheses were tested. The first four hypotheses looked for effects due to motivational orientation on harvest behavior during the full experiment, and during four 10-trial stages. It was expected that individualistic subjects, seeking to maximize their own outcomes, would request more resource A and fewer resource B units per-trial during the course of the full experiment than would cooperative subjects. Also, the 40-trial experiment was segmented into four 10-trial stages. It was expected that for each stage of the experiment, individualistic subjects would request more resource A and fewer resource B units per-trial than would cooperative subjects.

HO₁: There is no difference in units of resource A requested per-trial by persons having different motivational orientations.

HA₁: Individualist subjects will request more units of resource A per-trial than will cooperative subjects.

HO₂: There is no difference in units of resource A requested per-trial during each stage of the experiment by individuals having different motivational orientations.

HA₂: Individualistic subjects will request more units of resource A per-trial during each stage of the experiment than will cooperative subjects.

HO₃: There is no difference in units of resource B requested per-trial by persons having different motivational orientations.

HA₃: Individualistic subjects will request fewer units of resource B per-trial than will cooperative subjects.

HO₄: There is no difference in units of resource B requested per-trial during each stage of the experiment by individuals having different motivational orientations.

HA₄: Individualistic subjects will request fewer units of resource B per-trial during each stage of the experiment than will cooperative subjects.

The final three hypotheses focused on effects due to declining resource pools. As the experiment progressed, the resource pools were steadily depleted through false feedback. It was predicted that subjects would request fewer units of resource A over time, and more of resource B over time. For total resources requested (resources A and B combined), it was predicted that requests would decline over time.

HO₅: There is no difference in units of resource A requested per-trial during each of the four stages during the experiment.

HA₅: Subjects will request fewer units of resource A per-trial during latter stages of the experiment than during earlier stages.

HO₆: There is no difference in units of resource B requested per-trial during each of the four stages during the experiment.

HA₆: Subjects will request more units of resource B per-trial during latter stages of the experiment than during earlier stages.

HO₇: There is no difference in total resource units requested per-trial during each of the four stages during the experiment.

HA₇: Subjects will request fewer resource units per-trial during latter stages of the experiment than during earlier stages.

Methodology

Motivational Orientation

To assess which motive was dominant for a particular subject, several measurement techniques using decomposed games were available (Messick and McClintock 1968; Pruitt 1976; Griesinger and Livingston 1973; Kuhlman and Marshello 1975b). The procedure used in this study was based upon the geometric procedure originally proposed by

Griesinger and Livingston (1973). The specific procedure and its details will not be reviewed here, since it has been reported in depth elsewhere. Interested readers are referred to Loomis (1989) and Liebrand (1984).

Experiment Procedure

After the subjects had arrived, the experimenter provided a brief set of instructions concerning operation of the computer terminals, and the nature of the "interactive" computer system. Although the computers were physically linked together, each computer in fact operated as a stand-alone unit. No linkage was necessary because the same false-feedback concerning the resource pools was being provided to each subject. It was important, however, that the participants believe they were interdependent in the harvesting of resources.

Subjects participated in groups of six, but were led to believe they were part of a much larger group of 24 persons which, when the experiment began, would automatically and randomly be split by the computer into two groups of 12 persons each. This deception was necessary for two reasons. The first was to minimize or eliminate a subject's expectation that a drastic shift in their own harvest requests should result in a noticeable difference in pool size as a result of their action, and second, to remove a person's belief that through strategic harvest behavior they could influence the behavior of others. Several steps were taken to cause people to think they were part of a 24-person group. As each subject arrived, the experimenter conspicuously checked their name off a list containing a total of 24 names. Second, subjects were seated in cubicles numbered 19 through 24. Finally, after all instructions had been given and the subjects were ready to begin the experiment, the experimenter called to the "other" experiment location where the other 18 participants were supposedly located to tell them all was ready. The "other group" was never ready, and would require a few more minutes. After a minute or two, the phone would ring one time (the call being made by an accomplice) signaling the experimenter the "other group" was also ready, and to begin the experiment.

Once the operation of the computer network had been explained, subjects were seated and provided with instructions concerning the task itself. The instructions were presented on-screen where subjects could read them at their own pace. All subjects received the same information concerning resource harvesting and pool replenishment. Subjects were told they would be participating in a decision-making task in which they and 11 other persons would individually

harvest from a renewable resource pool. Each subject was told they had equal access to and shared a resource pool which initially contained 3,000 units of resource A and 3,000 units of resource B. On each turn (trial) each subject could request up to 20 units of resource A, up to 20 units of resource B or up to 20 units of resources A and B combined. Once all 12 members of the group had made their requests, the computer would respond, indicating to each subject how many units and points they individually received in response to their request, and their cumulative total units and points harvested.

Total units of resources A and B harvested would then be subtracted from the existing resource pool. Subjects were told the remaining amounts would then be multiplied by the replenishment rate of 1.05, thus adding 5% to each resource pool for the next trial. Subjects were told the resource pools could not replenish themselves in excess of 3,000 units each. These calculations never actually occurred, of course, because the computer program was rigged to provide a pre-set pool size for each resource after each trial. Subjects in fact had no effect on pool size. Subjects were in isolated cubicles, and were not aware of the harvest requests or successes of the other participants. Subjects earned 0.5 cents per point harvested, making their decisions and the dilemma they faced have real implications.

Upon completion of the instructions and the answering of any questions, the experimenter made the phone call to the other experiment location to inform that group that the experiment could begin. Once the one-ring start signal was received, subjects were told to begin. The experiment lasted 40 trials.

Results

Manipulation Checks

A post-experiment question sought to determine whether or not subjects realized the size of the two resource pools were decreasing in size over time. Subject responses to the statement "I knew before each turn whether or not the resource pools were increasing or decreasing in size" indicated their understanding of the trend in pool size. Subjects responded on a 7-point scale (1=strongly disagree, 4=neutral, 7=strongly agree). On this item it was important that subjects were aware of the trend in pool sizes since subject behavior under the situation of a diminishing pool size was of interest in this study.

An examination of the mean response to this statement ($\bar{X}=5.13$) indicates subjects did

understand that the resource pools were decreasing in size over time. Based on these results, it was concluded that subjects were aware of changes in pool size over time.

A manipulation check to determine the effectiveness of the group-size deception was also performed. It was important that subjects believed they were part of an interactive group, and not making requests independently on a stand-alone computer. To assess the effectiveness of the group-size manipulation, subjects were asked on the post-experiment questionnaire "How many other persons were harvesting from the same resource pool as you?" Responses to this question ($\bar{x}=9.1$) showed that subjects believed they were part of a group having 8 other members. Based upon these results, it was concluded that the group-size deception was also successful.

Hypotheses Testing

For the t-tests used to test H_{01} through H_{04} , a .10 level of significance was used as the decision rule (Blalock 1979; Kirk 1982; Christensen 1977; Gregoire and Driver 1987). For H_{05} through H_{07} , a repeated measures ANOVA procedure was used. Since the set of assumptions attached to this procedure is more restrictive, a .05 level of significance was used.

The maximum number of units that could be requested during any single trial was 20 (resource A, resource B, or resources A and B combined). The average per-trial request for resource A during the full experiment was 11.00 units (Table 1). Cooperative subjects requested fewer units (10.10), and individualistic subjects more units (11.90). This difference was significant at the .10 level (Table 2). H_{01} was therefore rejected, and because the difference in requests is in the predicted direction, HA_1 was accepted.

Significant differences in resource A harvest requests were also found between cooperative and individualistic subjects for stages one and two (Table 2). However, the results for stages three and four were not significant. H_{02} was therefore tentatively rejected and HA_2 was tentatively accepted, since differences in requests were as predicted.

The average per-trial request for resource B during the full experiment was 7.52 units (Table 3). Cooperative subjects requested slightly more units (7.98 units), and individualistic subjects slightly fewer units (7.07). This difference was not significant at the .10 level (Table 4). H_{03} is therefore not rejected.

Table 1. Mean units of resource A requested according to motivational orientation and stage.

| | Stage | | | | Total |
|-----------------|-------|-------|-------|------|-------|
| | One | Two | Three | Four | |
| Individualistic | 16.52 | 12.82 | 9.56 | 8.70 | 11.09 |
| Cooperative | 14.25 | 9.92 | 8.35 | 7.90 | 10.10 |
| Total | 15.38 | 11.37 | 8.95 | 8.30 | 11.00 |

Table 2. Tests for differences between cooperative and individualistic subjects on units of resource A requested during the full experiment, and during stages one through four.

| Stage | Units Requested | | t | p |
|-----------|-----------------|-------|-------|------|
| | Individ. | Coop. | | |
| Full exp. | 11.90 | 10.10 | 2.082 | .041 |
| One | 16.52 | 14.25 | 2.552 | .013 |
| Two | 12.82 | 9.92 | 2.963 | .004 |
| Three | 9.56 | 8.35 | 1.041 | .302 |
| Four | 8.70 | 7.90 | .657 | .513 |

Table 3. Mean units of resource B requested according to motivational orientation and stage.

| | Stage | | | | Total |
|-----------------|-------|------|-------|------|-------|
| | One | Two | Three | Four | |
| Individualistic | 3.26 | 6.51 | 8.88 | 9.65 | 7.07 |
| Cooperative | 5.07 | 8.52 | 9.18 | 9.17 | 7.98 |
| Total | 4.16 | 7.52 | 9.03 | 9.41 | 7.52 |

Significant differences in harvest requests for resource B were found between cooperative and individualistic subjects for stages one and two. However, the results for stages three and four were not significant. H_{04} is rejected, and HA_4 tentatively accepted.

When harvest requests were examined across the four stages, over time, the results showed a decline in requests for resource A, an increase in requests for resource B and a decline in total

Table 4. Tests for differences between cooperative and individualistic subjects on units of resource B requested during the full experiment, and during stages one through four.

| Stage | Units Requested | | t | p |
|-----------|-----------------|-------|-------|------|
| | Individ. | Coop. | | |
| Full exp. | 7.07 | 7.98 | 1.295 | .200 |
| One | 3.26 | 5.07 | 2.302 | .024 |
| Two | 6.51 | 8.52 | 2.381 | .020 |
| Three | 8.88 | 9.18 | 0.306 | .760 |
| Four | 9.65 | 9.17 | 0.430 | .669 |

requests (resources A plus B) (Tables 1, 3, 8). Results of the repeated measures ANOVA showed these differences to be significant. H_{05} , H_{06} and H_{07} were therefore rejected. A series of paired t-test contrasts were conducted to determine which between-stage differences were significant (Table 8). In all three cases, significant differences were found between stages one and two, and between stages two and three. No significant differences were found between stages three and four. HA_5 , HA_6 and HA_7 were therefore accepted.

Table 5. Repeated measures ANOVA test for differences in resource A units requested according to stage and motive.

| Effect | F | p |
|----------------|---------|------|
| Stage | 121.023 | .000 |
| Stage X Motive | 2.004 | .161 |

Table 6. Repeated measures ANOVA test for differences in resource B units requested according to stage and motive.

| Effect | F | p |
|----------------|--------|------|
| Stage | 65.538 | .000 |
| Stage X Motive | 4.042 | .048 |

Table 7. Repeated measures ANOVA test for differences in total resource units requested according to stage and motive.

| Effect | F | p |
|----------------|--------|------|
| Stage | 13.611 | .000 |
| Stage X Motive | 0.506 | .479 |

Table 8. Paired t-test contrasts to identify between-stage differences in resource units requested.

| Units Requested (A) | | | | | | |
|---------------------|-------|-------|------|-------|--------|------|
| Stage | | | | Mean | | |
| One | Two | Three | Four | Diff. | t | p |
| 15.38 | 11.37 | | | 4.01 | 10.378 | .000 |
| | 11.37 | 8.95 | | 2.42 | 5.552 | .000 |
| | | 8.95 | 8.30 | .65 | 1.361 | .178 |

| Units Requested (B) | | | | | | |
|---------------------|------|-------|------|-------|-------|------|
| Stage | | | | Mean | | |
| One | Two | Three | Four | Diff. | t | p |
| 4.16 | 7.52 | | | 3.36 | 8.843 | .000 |
| | 7.52 | 9.03 | | 1.51 | 3.473 | .001 |
| | | 9.03 | 9.41 | .38 | .796 | .429 |

| Total Units Requested | | | | | | |
|-----------------------|-------|-------|-------|-------|-------|------|
| Stage | | | | Mean | | |
| One | Two | Three | Four | Diff. | t | p |
| 19.55 | 18.88 | | | .67 | 2.797 | .007 |
| | 18.88 | 17.98 | | .90 | 2.849 | .006 |
| | | 17.98 | 17.71 | .27 | 1.112 | .270 |

Discussion and Conclusions

Based on the existing literature, a series of predictions were made concerning the harvest behavior of cooperative and individualistic subjects, and the behavior of individuals faced with a pair of resource pools, having different values, declining in size at different rates. The results of this experiment support these predictions. Cooperative subjects requested fewer units of resource A and more of resource B when compared to individualistic subjects. Over time, as both resource pools declined in size, subjects of both orientations reduced their requests for resource A (the more rapidly declining but more valuable resource), and increased their requests for resource B. Total requests declined by a statistically significant amount. However, in

practical terms this reduction was negligible. Results indicate subjects shifted their requests from the higher valued but less plentiful resource A to the more plentiful resource B. Total requests (A plus B) remained near the maximum allowed, 20 units. This can be compared to earlier research in which subjects harvested from a single resource, which was declining over time (Loomis 1989). In that study subjects responded to the decline by reducing their requests. It would appear that given the opportunity, people will substitute or use lower valued resource to allow a higher valued resource the chance to recover.

This study has replicated earlier work, and has extended what is known about the relationship between harvest behavior and resource characteristics. This work, and related research should help recreation resource managers avoid resource overuse or depletion.

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UTILIZATION OF TRENDS IN VISITOR USE,
FACILITIES AVAILABLE, VEHICLE REGISTRATIONS,
AND LICENSE SALES AS OUTDOOR RECREATION
DEMAND INDICATORS

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Considerable funds are allocated by public agencies to gather data for estimating outdoor recreation demands and preferences. Many public and private recreation agencies and organizations collect public use data, recreation facilities available, registrations and license sales. This paper explores the use of such data for predicting demand for certain activities as an alternative to collecting demand information through costly household surveys.

Public agencies often allocate relatively large sums of money towards studies and surveys designed to determine and predict the demands and/or preferences for outdoor recreation areas and facilities. In Maine the Bureau of Parks and Recreation has utilized the results of national recreation surveys, a New England Recreation Demand Survey, several demand/preference surveys and a State Travel Study in 1985, to predict total participation in recreation activities. The Bureau has also utilized the results of other agency surveys conducted in Maine which collected recreation information valuable in preparing the State Comprehensive Outdoor Recreation Plan (SCORP), as well as other planning studies.

It is not the intent of this effort to question the results and value of these many surveys. The survey findings cited were used in Maine SCORP's prepared in 1977, 1983, and 1988 with some degree of confidence and with reasonable results. Rather, this project was undertaken to investigate the possibility that there are other currently collected data in Maine that could be utilized to objectively predict the trend of total participation in the activities most often sought in Maine's outdoors.

The primary purpose of this effort is to estimate an annual growth rate in participation in an activity that can be applied towards predication of total growth in that activity over a short period of time. The annual growth rates estimated can be used in SCORP where growth is predicted for a five-year period, or they can be used in an agency program assessment, such as now underway in the Bureau of Parks and Recreation. Total participation in an activity is estimated recognizing that the state of the economy, fluctuating travel costs, and seasonal weather patterns can greatly influence totals in a given year.

To project total participation in an activity in the 1988 SCORP to the year 1993, the annual growth rates were calculated from participation days from the two Maine Travel Studies completed in 1974 and 1985. Findings indicated that tourism visitation grew at an annual rate of 4.34% for residents and 5.21% for nonresidents between 1974 and 1985. These percent growth rates were applied to each activity studied in the 1988 SCORP. Thus, as a minimum this effort can improve upon the 1988 projection techniques in that a unique growth rate can be determined for each activity for which trend data is available.

The annual growth rates were calculated for the 17 outdoor recreation activities for which some information was readily available. The 17 activities are listed on the attached Table 1. Following is a brief overview of the findings for each activity examined.

Boating - Good boat registration data available but absolutely no use data. Since 1986 registrations have increased at an annual rate of about 8%. An aging population has more income and more interest in upscale activities. A lagging economy and higher gasoline prices could slow growth. An average annual growth rate of 7% over the next five years is predicted. Boating parking

spaces have increased in Maine 75.2% annually since 1972, largely due to a dedicated fund boat access program.

Canoeing - Good use data from two rivers and North Maine Woods, Inc. All three sources charge fees for overnight use, and North Maine Woods charges a day-use fee as well, thus total participation is somewhat controlled by user cost considerations. An aging population with more income and leisure time will move from canoeing to sailing and pleasure boating. Small growth rate predicted over the next five years.

Downhill skiing - No public use data at all, but data could be collected from the private sector. Daily lift capacity in persons increased by 3.73% annually between 1977 and 1988 based upon data collected for the SCORP process. An aging population with more income and leisure time will continue to participate in this activity.

Family camping - Use data from 11 State Parks, the Evans Notch District of the White Mountain National Forest, and Acadia National Park indicates a 2.79% annual growth rate in participation days since 1986. Prior to 1986 visits to most of these facilities declined since the early 1970's. The number of campsites available increased by 1.89% between 1972 and 1988. An aging population with more income will move from family camping to motor home, seasonal home, and resort vacations.

Fishing - Use data from North Maine Woods and license sales for both residents and nonresidents. Slow growth from North Maine Woods of 1% annually is somewhat influenced by user fee system. Growth in license sales of 4% for residents and 11% for nonresidents annually is

closer to the difference between national survey results from 1980 and 1985. Aging population with more leisure time and more income will utilize larger, motorized boats and continue to fish.

Freshwater Swimming - Use data from eight State Parks. Annual average percent increase of 3.35% since 1986. An aging population will swim less, thus the average annual percent change in total participation should be lower over the next five years.

Golf - No use data available, but will investigate collection of data from golf courses. Number of golf holes, collected for the SCORP process, has increased by 1.96% between 1972 and 1988. An aging population with more income and leisure time will increase their total participation days in golf.

Hiking - Use data from three State Parks, Baxter State Park, North Maine Woods, and miles of hiking trail collected for the SCORP process between 1972 and 1988. Use data indicates a 2.90% annual increase in participation days since 1986. Facility data shows an average annual growth of 2.75% for miles of hiking trail available. An aging population with more income will move to upscale activities. Average annual growth in participation days will be smaller over next five years.

Hunting - Use data from North Maine Woods and license sales for residents and nonresidents. Nonresident license sales are increasing while resident sales are decreasing. An aging population with more income and leisure time will continue to hunt at same pace. At best, total participation in the activity will remain stable.

Picnicking - Use data from five State Parks. Facility data collected through the SCORP process is not useable because of closure of DOT highway rest areas in the 1970's. Use data indicates a 4.93% annual increase in participation days since 1986. Prior to 1986 there was virtually no growth in the activity. As children leave the homes of the aging population, total participation in picnicking will increase at a slower annual rate.

Primitive camping - User data from Baxter State Park and the North Maine Woods indicates a 2.85% increase in participation days since 1976. An aging population with a continued interest in fishing and boating will use primitive campsites at a greater growth rate than in the past.

Nature walking - Use data from one State Park shows an annual 1.38% increase in total participation since 1986. Between 1972 and 1988 designated trail miles increased by 5.24% annually. An aging population will increase total participation in the activity at a greater rate than in the past.

Rafting - Data from the three major rafting rivers in Maine indicate that the explosive growth of the 70's and early 80's is apparently over. The average annual growth rate since 1984 has been 5.97%. In the last two years total participation days has declined. Maximum use on all three rivers is somewhat controlled either by outfitter daily allocations, trip size limits, or water releases from storage dams.

Saltwater swimming - User data from four State Parks. Average annual growth rate in total participation since 1986 is 6.77%. An aging population will swim less, thus the average annual growth rate in total

participation days should be smaller over the next five years.

Sight-seeing - User data from five State Parks, all State Historic Sites, Acadia National Park, and the West Branch Penobscot show an average annual growth rate of 10.89% since 1986. An aging population with more income and leisure time will continue to visit sight-seeing attractions at a relatively high average annual growth rate.

Ski touring - No user data available, but will attempt to collect from the private sector. Designated miles of trail increased by 6.31% between 1972 and 1978. An aging population with more income and leisure time will continue to participate in ski touring at a relatively high average annual growth rate.

Snowmobiling - No use data available. Miles of designated trail have quadrupled since 1972, largely due to a State-administered dedicated revenue program. Number of sleds registered have increased by 3.66% annually since the 83/84 season. The number of sleds registered peaked at 73,737 in 74/75 and, discounting the gasoline shortage years, bottomed out at 42,177 in 82/83. The activity now appears to be on a rebound, perhaps because an aging population has more income and leisure time.

Other major activities which must be examined at the State level for which little or no information is available include horseback riding, all-terrain vehicle trail riding, bicycling, sailing, and ice fishing. Activities which are local in nature--which need not be examined at the State level, include tennis, jogging, softball, baseball, pool swimming, basketball, ice skating, walking

for pleasure and sled and snow play. It is hoped that these activities will be examined in detail by towns when preparing their comprehensive plans towards meeting the State Growth Management legislation.

In the process of collecting data it has been found that more detailed data could be collected from several agencies with ease. For instance, the Bureau of Parks and Recreation tallies its boat site use data with other day-use for the park, thus producing a total day-use number, and consequently losing the boat site user data. Procedures have been initiated with State Park personnel to record and tally the boat user data separate from other day-use.

In these preliminary analyses Maine's aging population has been considered in a general sort of way, towards making a first rough approximation of what the average annual rates of growth might be for each of 17 outdoor activities. It was assumed that an aging population has more buying power, leisure time, and fewer family responsibilities. At a certain age, total outdoor recreation participation begins to decrease as health problems increase. In the preparation of Maine's next SCORP, current participation rates will be compared with predicted shifts in Maine's age groupings and household structure to more accurately predict the average annual growth rates. Meanwhile, public use data will be collected every year and new data, when available, will be added to the data base.

TABLE 1
AVERAGE ANNUAL CHANGES IN RECREATION PARTICIPATION
(Visits or Visitor Days)
for 17 OUTDOOR RECREATION ACTIVITIES in MAINE

| Activity | Predicted Average Annual % Change Next 5 Years | Data Used in Predictions |
|---------------------|--|---|
| Boating | 7 | Total boats registered; pleasure boats registered; boat parking spaces |
| Canoeing | 2 | Allagash and St. John Rivers use data; North Maine Woods data |
| Downhill Ski | 4 | Capacity increases 72-88 |
| Family Camping | 2 | 11 State Parks; Evans Notch District WMNF; Acadia National Park; Number of campsites available 72-88 |
| Fishing | 5 | License sales; North Maine Woods data; National fishing surveys |
| Freshwater Swimming | 2 | User data from 8 State Parks |
| Golf | 3 | Number of golf holes increase 72-88 |
| Hiking | 2 | User data from 3 State Parks; Baxter State Park and North Maine Woods; Designated trail miles 72-88 |
| Hunting | 0 | License sales; North Maine Woods; National hunting surveys |
| Picnicking | 3 | User data from 5 State Parks |
| Primitive Camping | 4 | Baxter State Park; North Maine Woods |
| Nature Walking | 4 | One State Park and designated trail miles 72-88 |
| Rafting | 2 | User data from 3 rivers |
| Saltwater Swimming | 5 | User data from 4 State Parks |
| Sight-seeing | 7 | User data from 5 State Parks; all State Historic Sites; Acadia National Park; and West Branch Penobscot |
| Ski Touring | 6 | Designated trail miles 72-88 |
| Snowmobiling | 4 | Sleds registered; designated trail miles 72-88 |

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PUBLIC RECREATION ON NONINDUSTRIAL PRIVATE

FORESTLANDS (NIPF) IN THE 1990's

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The occurrence of public outdoor recreation on nonindustrial private forestland (NIPF) is related to parcel size. A sample of Vermont NIPF owners indicates that one-third prohibited public outdoor recreation on their property and one-third of these prohibitors owned <20 acre parcels. Conversely, all owners of >500 acre parcels allowed public recreation use of their property. NIPF fragmentation, resulting from economic pressures to convert forestland to other uses, has a negative effect on the availability of NIPF for public outdoor recreation.

The NIPF Problem

The future of public outdoor recreation on NIPF is uncertain because of the demand for development space in the continuously urbanizing Northeast. Ninety percent of the region's private forest-land ownerships are nonindustrial and they represent about 70% of all the private forestland in the region. Much of this acreage is constantly exposed to economic pressures that eventually force its fragmentation and conversion to urban land uses. One of the consequences of these events is the elimination of public outdoor recreation opportunities on NIPF. Rural-to-urban land conversion continuously takes place over a large percentage of the Northeast. Driven by the economics of land supply and demand, the multi-billion dollar development industry, which includes willing buyers and sellers, speculators, real estate agents, brokers, investment syndicates, lawyers, bankers, surveyors, developers, and contractors, act as catalysts in the conversion of NIPF to urban land uses for profit.

Land that has been in farm and forest, often compatible with public outdoor recreation, is liquidated for value added revenue. With the passing of the plow and the cow and the tree and the saw, comes the hammer and nail and real estate sales. During this land use conversion, public access to private outdoor recreation resources for such activities as hunting, fishing, hiking, snowmobiling, cross country skiing, ATV use and nature observation is eliminated. Are extensive wildland sports doomed on private forestlands in the Northeast?

Studies of public outdoor recreation use of private lands, completed over the past decade, have been mostly concerned with landowners'

reactions to public use and the conditions placed on use. How much land posting occurs? Is there property damage? What kinds of recreation does the landowner allow? How much and during what seasons is recreation allowed? Is use allowed by default, permission, or for a fee? (Gilbert and Samek 1976, Gilbert 1985, Lindsay 1974, 1976). Now, the more important questions are not those surrounding the conditions of use but if use can continue to take place at all. How much NIPF has been converted to alternative land use? How much remains unconverted in urbanizing sectors and what are the rates of change?

In many rural states like Vermont, there is a long history of public recreation access to private forestland. This implicit public use policy is severely undermined where rural land values are replaced by urban real estate values and the resulting smaller parcel sizes no longer physically or socially support extensive forms of outdoor recreation. A combination of rural immigration, increased mobility, dispersion of the work force, the desire to live in quality environments, and different attitudes of nouveau rural residents towards public use of their property, results in reduced public access to NIPF now undergoing the fragmentation process.

Driscoll (1985) demonstrated that the frequency of extensive outdoor recreation activities allowed on private land, diminishes with smaller property sizes. One out of three landowners he studied, prohibited one or more forms of outdoor recreation on their property. Of these, 46% prohibited all forms of recreation. Twenty-nine percent of the landowners who denied access owned NIPF parcels in the 10 to 19 acre category. Contrary to this negative relationship between smaller property sizes and public recreation access, the study detected no landowners in the >500 acre category that prohibited public access. Further, landowners of >100 acre parcels reported 36% more public recreation use of their property than did owners of <100 acre parcels.

If smaller parcel size is directly related to a decrease in public access to private recreation resources, consider the impact of forest-land fragmentation in urban states like Connecticut, Massachusetts, Maryland, New Jersey, Rhode Island, and major portions of New York and Pennsylvania where NIPF parcels average 24 acres in size. The rural states of Maine, New Hampshire and Vermont average almost twice this NIPF parcel size (41 acres) but their average is also declining as they urbanize in several locations (Table 1). When a state urbanizes, average NIPF parcels decrease in size and public outdoor recreation becomes more and more restricted.

The reduction in private lands open to public outdoor recreation use is significant in the Northeast and continues to decline. At the end of World War II (1945), for example, Vermont farmland, regarded by many as a valuable outdoor recreation resource, was at a record high of 3.93 million acres. In 1987, less than half a century later, Vermont's farmland had declined 64% to 1.41 million acres (Table 2). Information

Table 1. Average NIPF parcel size in the Northeast Region.

| State | NIPF parcel size (acres) |
|-----------------------|--------------------------|
| Connecticut | 24 |
| Maine | 46 |
| Massachusetts | 23 |
| Maryland | 23 |
| New Hampshire | 36 |
| New Jersey | 23 |
| New York | 27 |
| Pennsylvania | 25 |
| Rhode Island | 23 |
| Vermont | 43 |
| Urban states' average | 24 |
| Rural states' average | 42 |

Table 2. Vermont land in farms (1940-1987).

| Year | Millions of acres |
|------|-------------------|
| 1940 | 3.65 |
| 1945 | 3.93 |
| 1950 | 3.55 |
| 1954 | 3.00 |
| 1959 | 2.90 |
| 1964 | 2.46 |
| 1969 | 1.80 |
| 1974 | 1.64 |
| 1982 | 1.58 |
| 1987 | 1.41 |

on the current use of the abandoned 2.52 million acres is lacking. It is certain however, that the land use has changed on them and the question is, what impact has the transition had on Vermont's outdoor recreation resources?

Vermont has been cited by the Bureau of the Census as the most rural state in the Nation but is currently struggling with development problems and growth control. Other states in southern portions of the Northeast region have experienced rural land conversion problems for decades. If Vermont is experiencing rapid growth in several of its rural areas, what does the future hold for outdoor recreation survival on NIPF in the more urbanized sectors of the Region?

Another indicator of pending land use change involving Vermont NIPF is Armstrong's (1988) reporting of timberland prices for various parcel sizes sold between 1984 and 1988 (Table 3). Not only are the prices rising for Vermont timberland (77% from 1984 to 1988), but the average price for smaller lots (75-99 ac.) is \$348 higher than for larger lots (>250 ac.). The average price per acre for Vermont timberland in the 75-99 acre category was \$716 in 1988, up \$317 (79%) from 1984. Clearly, as time advances and lot sizes decrease,

Table 3. Vermont timberland prices and number of parcels sold between 1984 and 1988.

| Parcel Size | 1984 | 1985 | 1986 | 1987 | 1988 |
|-------------|---------------|---------------|---------------|----------------|----------------|
| 75-99 | \$399 (31) | \$541 (45) | \$556 (47) | \$658 (114) | \$716 (111) |
| 100-249 | 337 (60) | 377 (79) | 392 (198) | 509 (240) | 572 (232) |
| >250 | 201 (22) | 241 (14) | 304 (48) | 296 (32) | 368 (53) |

Numbers in parentheses indicate the number of parcels sold. Source: Armstrong 1988.

the price per acre of Vermont timberland increases.

When NIPF parcels decrease in size, values other than natural resource values begin to affect timberland fragmentation and commensurate price increase. The signals are now strong that public access to these outdoor recreation resources are in imminent danger of termination because the NIPF property is in metamorphosis between a natural resource and a commodity and has a high probability of becoming a personal consumption item for a new landowner who will use it for residential or commercial development purposes.

What will the 1990's Bring?

In the 1990's, not only will NIPF continue to be converted to other land uses, but with it, associated outdoor recreation will remain restricted in the face of a worsening national economy and still large national debt. About the only organizations that seem to have the selective financial ability to accomplish land acquisition are the private and quasi-public land conservancies and commonly they deal with land restrictions that prohibit many forms of public recreation.

The only long term answer to the loss of outdoor recreation resources has always been and will remain, the identification of high potential, private lands and their purchase for public use. Planning, zoning, subdivision and tax relief programs have been shown to be vulnerable to rapidly rising land values and have demonstrated their inability over time to hold private land open for public use. If the public desires outdoor recreation opportunities in their communities, they will have to pay for the lands that support them. How are these funds to be raised? -- By taxing the causative land use change agents that result in the loss of open space and its natural resources...the development industry that starts, as we have seen, with a willing buyer and seller and progresses to include the real estate broker and financial institutions. A portion of the tax money collected from these sources operating in rapidly developing Vermont communities, could be distributed to towns where valuable outdoor recreation lands have been identified but not yet threatened and used for land acquisition purposes.

The open space, that is provided by NIPF, is a dear commodity that becomes more dear as the Northeast Region continues to urbanize. The price of open space will continue to rise in the 1990's. How much of it the residents of the Northeast desire and can afford, is the question of the 1990 decade.

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AN OBSERVATIONAL STUDY OF THE SOCIAL
AND BEHAVIORAL DIMENSIONS OF A PARK
AREA

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The concept of recreation "place" is receiving attention in recreation resource management. One line of study emphasizes the social definition of places whereby locales are assigned meaning through actual use history and managerial directives. Most studies approach place through survey means. This study used unobtrusive observation in the form of checklist data to assess the social and behavioral dimensions of a leisure locale. Findings show that such an approach can be useful in describing the actual use history of leisure settings.

Introduction

"Place" or "setting" is a concept upon which much research in recreation resource management is focused as managers must ultimately deal with actual physical places in carrying out their responsibilities. It is recognized that the recreation "setting" represents the interplay of physical, social and managerial attributes (Driver, *et.al.*, 1987). The social dimension of "setting" pertains to several interrelated issues such as invasion/succession; behavioral problems such as littering, theft and vandalism; subgroups of visitor populations with attendant variation in expectations, attitudes, and behavioral patterns; crowding and conflict issues within and between various user groups.

In addressing the issues noted above, much of the research work evolves around asking users how they feel about managerial actions, other user groups who use the activities at

particular sites, and their motives and satisfactions associated with particular sites. However, many of the issues listed above are also very closely related to the actual use history of the "setting" pertaining to who uses the "place", what activities actually occur there, and how the users are responding to managerial activity in their day-to-day behavior at the site.

Moreover, the social and behavioral dimensions of "setting" influence actual and potential use. Recreation places are ascribed meaning through the social groups that share use of the park. These common meanings or schemes-of-order predispose rules of conduct which influence who uses the park, what activities occur there, and how the user groups will respond to managerial actions (Cheek, *et.al.*, 1976). Such statements as "It's too crowded", "This is a family park", "We like the other campers", show the importance of the social dimension of "place" and its influence on actual and potential users. Similarly, designers and managers must assess the actual social and behavioral consequences of their developments and managerial approaches to discern how consequences compare with design/managerial objectives. Research endeavors that attempt to describe the social dimension of locales, i.e., who the users are, what do they do there, and what is the order of fluctuations in visitation, are needed in the field of recreation and parks (Burch, 1964). The administrator " . . . has more interest in description than in causality because his major problem is to know what is there so that he may act accordingly." (Burch, 1964, p. 3).

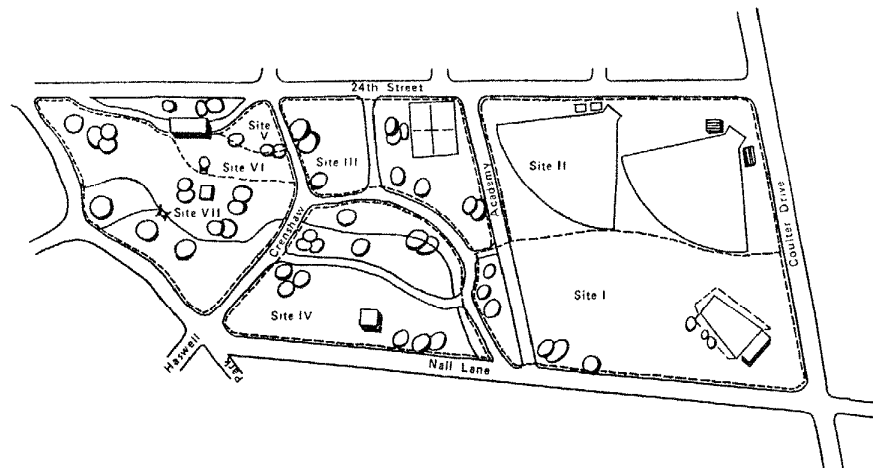
Objective and Methods

Objective

The objective of this study was a preliminary attempt to delineate selected variables associated with the social and behavioral dimension of a recreation locale. Specifically, this study assessed attendance patterns, activity patterns, age stratification, and gender use descriptions of a composite weekday's use of a recreation place. As this was an initial attempt by the observers to use unobtrusive observation to clarify the use history of a park, it was important to choose a park showing

Acknowledgement: Linda Frey, formerly a graduate student at Texas A&M University, helped with data collection for this study.

Figure 1.
HASWELL PARK



moderate to light use. Sue Haswell Park, in Bryan, Texas, was selected as an appropriate site for this exploratory study.

Selection of Observation Settings and Sampling Times

Seven observation settings were delineated by physical attributes and predominant activity at the park (See Figure 1). The settings that were selected permitted the observers to record all descriptors and behavioral units from one vantage point. A composite weekday based upon random selection of time frames and days of the week was compiled to dictate sampling times and days of the week when data were to be collected.

Instrumentation

The technique of unobtrusive observation was used to collect data in this study. The data were in the form of a checklist. For recording purposes, the data were limited to static descriptors and behaviors requiring a minimal amount of observer interpretation and maximal objectivity. In effect, the behavioral units observed were recorded almost instantaneously in predetermined categories. The observers recorded the predominant activity of each individual. Concurrent behaviors were not recorded. As such, reliability and validity were aided by the grossness of the descriptors and behavioral alternatives used. It is generally evident what a person's gender is, and it is relatively simple to

discriminate between a person who is throwing a frisbee and one who is utilizing the wading pool. In other words, there exists fairly consistent vocabulary for discriminating such phenomena (Burch, 1964, p. 3). The only interpretation required of the observers was the discrimination of the descriptors and behavioral type for the individual or group. The observers collaborated on the discrimination of descriptors and behavioral alternatives. The static descriptors sampled were age, sex and ethnicity of the user. The behavioral alternatives utilized were adapted from Christiansen (1976). Examples of the instrument and the behavioral alternatives list are presented in Figure 2 and Figure 3.

Figure 4
Behavioral Alternatives

| <u>*Physical</u> | <u>*Social</u> |
|-------------------|---|
| 1. Freeplay | 8. Card Playing |
| 2. Equipment | 9. Conversation |
| a. Swing | 10. Picnicking-Eating-Preparation |
| b. Slide | |
| c. Climb | <u>*Cognitive</u> |
| d. See Saw | 11. Reading |
| e. Merry-go-round | 12. Sitting-Spectator |
| 3. Jogging | 13. Photography |
| 4. Bicycling | 14. Painting-sketching |
| 5. Turfgames | |
| a. Badminton | <u>*Resource-Oriented</u> |
| b. Croquet | 15. Swimming |
| c. Frisbee | 16. Wading |
| d. Horseshoes | 17. Walking (Strolling, Walking Child, Walking Dog, etc.) |
| e. Volleyball | |
| 6. Court Games | |
| a. Basketball | |
| b. Tennis | |
| 7. Field Games | |
| a. Baseball | |
| b. Football | |
| c. Softball | |
| d. Soccer | |

* Categories adapted from Christiansen (1976)

Figure 3

Sample ... Checklist
Observer: P. J. K. DATE: / / TIME: : :

| SEX | RACE | AGE CLASS | GROUPING | ACTIVITY NAME OR DESCRIPTION |
|--------|--------------|--------------|---|------------------------------|
| 1. M F | BL N-A OTHER | CH AD SR-CIT | <input type="checkbox"/> ALONE <input type="checkbox"/> WITH 1 PER. <input type="checkbox"/> WITH MORE THAN 1 | |
| 2. M F | BL N-A OTHER | CH AD SR-CIT | <input type="checkbox"/> ALONE <input type="checkbox"/> WITH 1 PER. <input type="checkbox"/> WITH MORE THAN 1 | |
| 3. M F | BL N-A OTHER | CH AD SR-CIT | <input type="checkbox"/> ALONE <input type="checkbox"/> WITH 1 PER. <input type="checkbox"/> WITH MORE THAN 1 | |
| 4. M F | BL N-A OTHER | CH AD SR-CIT | <input type="checkbox"/> ALONE <input type="checkbox"/> WITH 1 PER. <input type="checkbox"/> WITH MORE THAN 1 | |
| 5. M F | BL N-A OTHER | CH AD SR-CIT | <input type="checkbox"/> ALONE <input type="checkbox"/> WITH 1 PER. <input type="checkbox"/> WITH MORE THAN 1 | |
| 6. M F | BL N-A OTHER | CH AD SR-CIT | <input type="checkbox"/> ALONE <input type="checkbox"/> WITH 1 PER. <input type="checkbox"/> WITH MORE THAN 1 | |

Data Collection

The procedures for actual recording of descriptors and behavioral units were adapted from those of Sears (1963) and Burch (1964). On the appropriate day and time frame, the observers entered the selected observation setting. The observers initially determined functional groups and individuals. Functional groups are defined as a collection of two or more persons involved in a similar activity where the participation of each member contributes and is essential to the prolongation of the activity. In instances of equipment use, a group was defined as all those using a piece of equipment at the time of recording. Under conditions where the discrimination of groups or individuals was difficult, the observers treated each user as an individual.

To guide the sequence of momentary observations, observations began at the far left corner of the observation setting and continued in a clockwise motion across the setting until all descriptors and behavioral units were recorded. Specifically, the observers looked at an individual just long enough to qualify the descriptors and decide what the individual was doing according to the predetermined activity typology.

Instructions for actual recording on the instrument are as follows (the reader should refer to the check-list, Figure 3.) The observer simply circles the appropriate descriptors

and enters the appropriate behavioral alternatives in the respective column. For example, if the observer notices two individuals playing with a Frisbee and they appear to be white adult males, the observer goes to column (1) and circles "male", then to column (2) and circles "other", circles "AD" in column (3), checks "with one person" in column (4), and enters (5c) in the behavioral alternative column. Row number two would be similar to row number one and would represent the other individual involved in the activity of throwing Frisbee. To delineate the functional group, the observer places a vertical line in the behavioral alternatives column connecting the two individuals. This indicates that the two were involved in the activity. The observer repeats this process for all the individuals in the observation setting.

The observers proceeded to the next observation setting and repeated the process. All observation settings within the park were sampled in the two-hour sampling time frame at thirty minute time intervals. When data were collected for all randomly selected time frames and days, the composite day was compiled.

The data were analyzed to determine (1) the range of recreational activities in the park; (2) the attendance pattern for total use, age, and gender; and (3) the proportion of park users of different ages, ethnicities, and individual versus group activity. Because of space limitations, only selected parts of the findings will be discussed.

Findings and Discussion

Patterns of Attendance

Figure 4 shows the average pattern of attendance over one composite weekday. Attendance ranged from a low average of approximately 5 people in the morning hours, increased to the noon hours, tapered off between the hours of 1 p.m. and 3 p.m., and peaked at an average attendance of approximately 25 people from 4 p.m. to 6 p.m. After that time, attendance sharply declined.

When age is included in the analysis (See Figure 5), it shows that children were the most frequent visitors to the park for all time periods during the composite day. Frequency of attendance averaged approximately 2 children during the early morning hours, increased during the afternoon hours, peaked between

Figure 4.

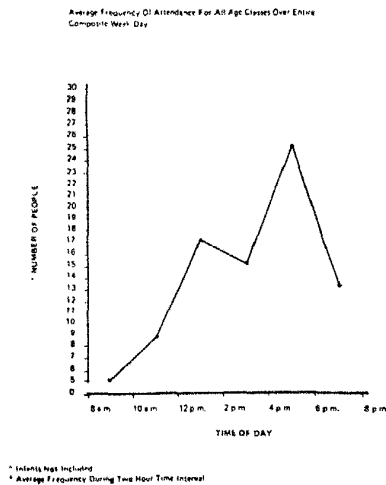
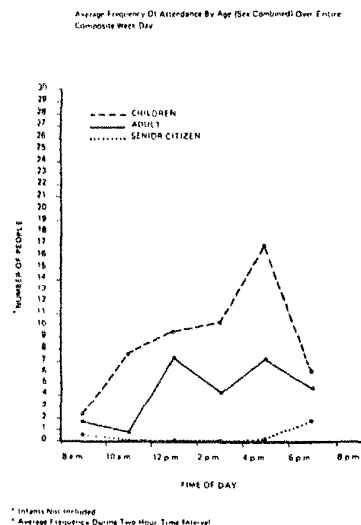


Figure 5.



the hours of 4 p.m. and 6 p.m., and then declined. Attendance patterns of adults in the park generally followed the average attendance pattern across all ages for the entire composite day. For adults, attendance peaked between the hours of 12 p.m. and 2 p.m., declined between 2 p.m. and 4 p.m., and then peaked again between the hours of 4 p.m. and 6 p.m. Attendance of the elderly was greatest in the early morning hours and evening hours. There were no elderly users in the park between the hours of 11:00 a.m. and 5:00 p.m.

Patterns of Activity

The data for the one-half hour time intervals were collectively analyzed in the two hour time frames. The analysis represents a profile of all recreational activities taking place at a particular time and at a particular observation setting throughout the composite weekday. The profile illustrates the frequency with which various recreational activities occur; the frequency with which they occur in different areas within the park; and age stratification, ethnicity, and functional grouping classifications of participants engaged in the activities.

Table 1 presents the proportion of all recreational activities over the entire composite weekday. Over all age classes and times, 26% of all activity is located in the physical recreation activity category, 13% is in the social recreation activity category, 30% of activity is in the cognitive recreation activity category, 27% is in the resource-oriented activity category, and 3% is located in the other activity category.

Located in the cognitive recreation activity category and representing the greatest proportion of all recreational activity during the composite day, the activity sitting-spectating represents 29% of activity. Within the resource-oriented activity category, the water activity wading is predominant, representing 16% of all activity during the composite day. In the physical recreation activity category, the low-organized activity swinging is the predominant activity. Swinging represents 11% of all activity during the composite day. The three aforementioned activities represent a total of 53% of all activity within the composite day. Adding to this table the percentages associated with the activity picnicking-eating-preparation and the activity walking, 74% of all activity during the composite weekday can be explained by these five activities.

By using the age classes in the analysis, predominant activities within age groupings can be discerned. The percentage breakdown of activity by children over the entire composite weekday will be the only age class discussed.

Table 1. Proportion of All Recreational Activities for All Age Classes and Times Combined Over the Entire Composite Weekday

| Experience Category | | | | | | | | | | | | | | |
|---------------------|------|--------|--------|------|--------|-----------|-------|--------|-------------------|------|--------|------------|-----|-------|
| Physical | | | Social | | | Cognitive | | | Resource-Oriented | | | Other | | |
| B.A.* | N** | % | B.A. | N | % | B.A. | N | % | B.A. | N | % | B.A. | N | % |
| 1 | (16) | 4.88 | 9 | (7) | 2.13 | 11 | (3) | 0.91 | 15 | (4) | 1.23 | Lying Down | (2) | 0.61 |
| 2a | (35) | 10.67 | 10 | (36) | 10.91 | 12 | (95) | 28.96 | 16 | (54) | 16.46 | Standing | (7) | 2.13 |
| 2b | (11) | 3.35 | - | - | - | 14 | (2) | 0.61 | 17 | (33) | 10.06 | - | - | - |
| 2c | (8) | 2.44 | - | - | - | - | - | - | - | - | - | - | - | - |
| 3 | (1) | 0.30 | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 | (5) | 1.52 | - | - | - | - | - | - | - | - | - | - | - | - |
| 6b | (4) | 1.23 | - | - | - | - | - | - | - | - | - | - | - | - |
| 7b | (2) | 0.61 | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 | (3) | 0.91 | - | - | - | - | - | - | - | - | - | - | - | - |
| Totals | (85) | 25.91% | - | (43) | 13.10% | - | (100) | 30.40% | - | (91) | 27.75% | - | (9) | 2.74% |

*B.A.-Behavioral Alternative

**N-Frequency

Table 2. Proportion of All Recreation Activity for Children Over the Entire Composite Weekday

| Experience Category | | | | | | | | | | | | | | |
|---------------------|------|--------|--------|------|-------|-----------|------|--------|-------------------|------|--------|------------|-----|-------|
| Physical | | | Social | | | Cognitive | | | Resource-Oriented | | | Other | | |
| B.A.* | N** | % | B.A. | N | % | B.A. | N | % | B.A. | N | % | B.A. | N | % |
| 1 | (16) | 7.51 | 10 | (10) | 4.70 | 12 | (37) | 17.40 | 16 | (54) | 25.30 | Lying Down | (1) | 0.47 |
| 2a | (33) | 15.50 | - | - | - | - | - | - | 17 | (26) | 12.20 | Standing | (3) | 1.41 |
| 2b | (11) | 5.20 | - | - | - | - | - | - | - | - | - | - | - | - |
| 2c | (8) | 3.75 | - | - | - | - | - | - | - | - | - | - | - | - |
| 4 | (7) | 3.28 | - | - | - | - | - | - | - | - | - | - | - | - |
| 6b | (2) | 0.94 | - | - | - | - | - | - | - | - | - | - | - | - |
| 7b | (2) | 0.94 | - | - | - | - | - | - | - | - | - | - | - | - |
| 8 | (3) | 1.41 | - | - | - | - | - | - | - | - | - | - | - | - |
| Totals | (82) | 38.33% | - | (10) | 4.70% | - | (37) | 17.40% | - | (80) | 37.50% | - | (4) | 1.88% |

*B.A.-Behavioral Alternative

**N-Frequency

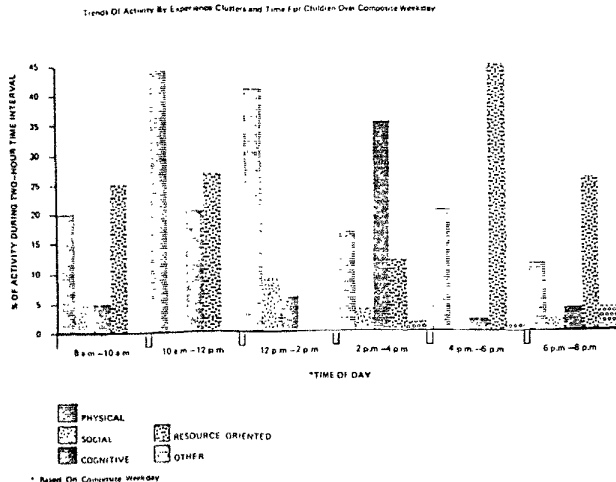
Typology of experience categories and activity clusters adapted from Christianson (1976).

Within the child classification (Table 2), the physical experience category is predominant. The activities swinging and freeplay account for 23% of all activity in this category. The second most prevalent category is resource-oriented activities; wading is the most predominant activity in the category, accounting for 25% of the activity. Wading is also the most predominant activity across all categories. Two additional activities, sitting-spectating (cognitive) and walking (resource-oriented) account for 30% of all activity in this age classification. Thus, the five activities--wading, swinging, freeplay, sitting-spectating and walking, account for approximately 78% of all child activity.

Utilizing the time variable in the analysis, it is possible to discern trends of activity by time and age classification. The child age class will be the only class presented.

During the time period, 8 a.m. to 10 a.m., the resource-oriented activities cluster is the most dominant in the child age classification (Figure 6). The physical recreation activities cluster is the second most prevalent. Individual activities within the physical recreation cluster and representing the greatest percentage of the cluster are tennis and football. Wading was the most prevalent activity in the resource-oriented activities cluster. During the time period 10 a.m. to 12 p.m.,

Figure 6.



the physical recreation activities cluster becomes dominant. Sliding and swinging were the prevalent activities in the cluster. The second most prevalent cluster is the resource-oriented cluster; wading and walking are the predominant activities. From 12 p.m. to 2 p.m., the physical recreation activities cluster is again dominant. The activities, swinging, freeplay, and climbing the jungle gym are predominant in the cluster. The social activities cluster is second in the rank order with picnicking-eating-preparation the predominant activity. Between 2 p.m. and 4 p.m., the cognitive activities cluster is dominant; however, the resource-oriented activities cluster dominates all other clusters from 4 p.m. until 8 p.m. From 2 p.m. to 4 p.m., sitting-spectating is the prevalent activity. Wading and walking are the dominant resource-oriented activities from 4 p.m. to 8 p.m.

These findings suggest a sequential pattern of use by children. During the morning hours, the park is generally utilized for physical types of activities. By mid-afternoon, the cognitive recreation activities are the most popular. Within the remainder of the afternoon and evening hours, resource-oriented activities become dominant.

Conclusions

The approach and partial presentation of findings of this exploratory study show the potential applicability of using unobtrusive observation in the form of checklist data to explore actual use history of park and resource areas. Using the checklist approach by visual or other electronic means may help managers address some of these issues: who is using their resource, what recreation activities are prevalent, how do changes in users and activities occur over a typical day's use, how do users respond to design alternatives and managerial activities.

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